

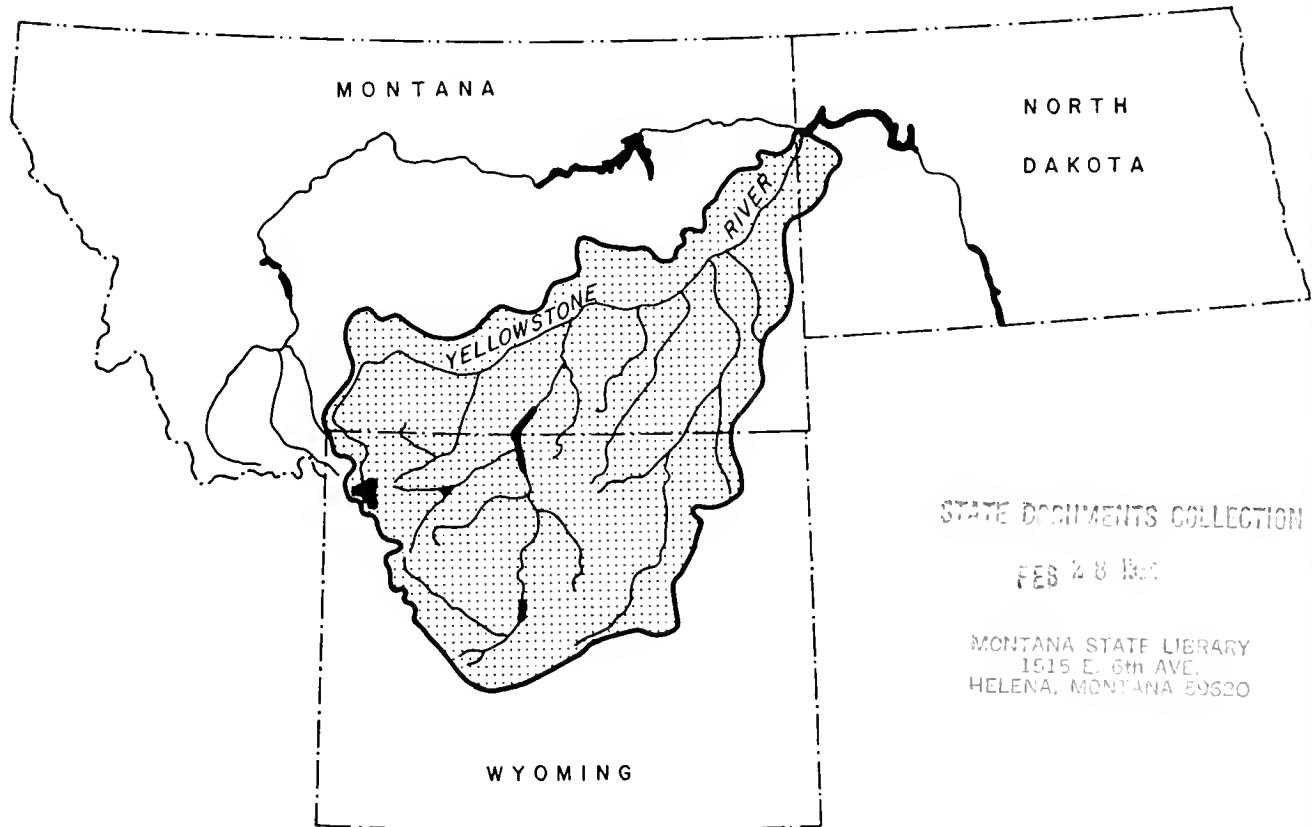
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# YELLOWSTONE RIVER COMPACT COMMISSION

WYOMING

MONTANA

NORTH DAKOTA



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YELLOWSTONE RIVER

COMPACT COMMISSION

FORTY-SECOND ANNUAL REPORT

1993



YELLOWSTONE RIVER COMPACT COMMISSION  
821 EAST INTERSTATE AVENUE  
BISMARCK, NORTH DAKOTA 58501

Honorable Mike Sullivan  
Governor of the State of Wyoming  
Cheyenne, Wyoming 82001

Honorable Marc Racicot  
Governor of the State of Montana  
Helena, Montana 59620

Honorable Edward T. Schafer  
Governor of the State of North Dakota  
Bismarck, North Dakota 58501

Dear Sirs:

Pursuant to Article III of the Yellowstone River Compact (Compact) the Commission submits the following forty-second annual report of activities for the period ending September 30, 1993.

Members of Yellowstone River Compact Commission convened their forty-second annual meeting on December 2, 1993 at 8:30 a.m. via teleconference. In attendance were Mr. William F. Horak, Jr., Chairman and Federal Representative; Mr. Gary Fritz, Administrator, Water Resources Division, Montana Department of Natural Resources and Conservation; and Mr. Gordon W. Fassett, Wyoming State Engineer. Also in attendance were Mr. Milo Vukelich, Wyoming Attorney General's Office; Ms. Sue Lowry, Wyoming State Engineer's Office; Mr. Joe A. Moreland, U.S. Geological Survey; Mr. Rich Moy, Montana Department of Natural Resources and Conservation; Mr. Matthew McKinney, Montana Governor's Office; and Mr. Robert Arrington, Montana Department of Natural Resources and Conservation.

Mr. Horak asked about the status of the McCarthy Ditch project. As originally conceived, the project involved diversion of water from the Tongue River in both Montana and Wyoming to irrigate lands in both States. The permittee had requested water use permits from both Montana and Wyoming. Mr. Fassett reported that the land owner had redesigned the project to eliminate diversion points in Montana. The question of the need for Montana water permits to divert in Montana has therefore been resolved and the Wyoming State Engineer's Office has approved the permits for diversions in Wyoming.

Mr. Horak asked if Montana wanted to discuss the issue of Compact administration. He reminded the Commission that Montana had offered to circulate a draft report on their research into Compact administration issues at the last Commission meeting and asked if the report was available. Mr. Fritz stated that the subject would be discussed later in the meeting.

Mr. Moreland reviewed budget estimates that had been provided to each of the Commission members. He indicated that cost of operating streamflow monitoring stations and preparing the annual report totalled \$42,900 in water year 1993 ending September 30, 1993. He estimated that cost of operations would be \$45,200 for water year 1994, \$47,500 for water year 1995, and \$64,800 for water year 1996. He stated that the estimate for water year 1996 included \$15,000 to relocate the Tongue River gaging station downstream about 3 miles. During periods of low flow, the river migrates across the wide channel at the present gaging station making stage recording difficult. At a site closer to the mouth, the river channel is more constricted and would be a more suitable location to gage low flows. The Commission agreed to seek funding to relocate the gage in water year 1996.

Mr. Moreland reported that streamflow conditions in water year 1993 reflected a wet spring and summer in the eastern part of the basin. Streamflow was 92 percent of average in the Clarks Fork of the Yellowstone River, 86 percent of average in



the Bighorn River, 116 percent of average in the Tongue River, and 130 percent of average in the Powder River. Most reservoirs had more water in storage at the end of the 1993 water year than at the end of the 1992 water year.

Mr. Fassett stated that, although Buffalo Bill Reservoir did not fill in 1993, the reservoir level rose into the new storage pool for the first time since the dam was raised.

Mr. Horak requested an update on Montana's plan for conflict resolution. Mr. McKinney stated that details of the plan are contingent on the U.S. Geological Survey position on voting status of the Federal Representative and asked if the situation had changed. Mr. Horak commented that the current Administration has not announced the selection of a new Director for the U.S. Geological Survey. He noted that the Chief Hydrologist has not altered his position on the U.S. Geological Survey representative's role as an impartial member of the Commission.

Mr. McKinney asked if the Commission wanted to postpone further work on a conflict resolution process until the new Director has been named. Mr. Fassett recalled that he and Mr. Fritz had discussed delaying the planning effort until imminent personnel changes were completed. If the new Administration's position on voting status did not resolve the question, they were prepared to provide a list of alternates to replace the current Chairman.

Mr. Fritz asked when a new Director would be named. Mr. Horak stated that an announcement is expected in the very near future. Mr. Moreland noted that confirmation of a nominee would probably not occur before Congress reconvenes in January. Mr. Fritz suggested that the Commission discuss the issue with the new Director before taking further action. Mr. Fassett wondered if the Commission should present their case to Ms. Rieke, Assistant Secretary for Water and Science, to gain support. Mr. Fritz noted that Ms. Rieke has stated that the U.S. Geological Survey should continue to maintain its role as a scientific agency and avoid advocacy positions. He expressed doubt that Ms. Rieke would support the Commission in its efforts to change the U.S. Geological Survey stance.

Mr. Horak asked if the Commission's desire was to wait until the new Director has been named. Mr. Fritz remarked that the Commission can not postpone the matter indefinitely. It would be desirable to have a process in place before a contentious issue arises. Mr. Fassett agreed that Mr. McKinney should proceed with his planning activities.

Mr. McKinney asked if Mr. Fassett had reviewed the July 29, 1992 draft of the conflict resolution plan. Ms. Lowry stated that the most recent version she had seen was dated June 23, 1992. Mr. Horak suggested that Mr. McKinney provide copies of the July 29, 1992 draft to all the Commission members for review.

Mr. McKinney noted that the last version of the plan was based on the premise that the Federal Representative would not have voting status. Mr. Fassett stated that a conflict resolution process is needed even if the Federal Representative has voting status. Mr. Fritz observed that the current draft outlines a State-funded mechanism to resolve conflicts that could have been resolved by a voting Federal Representative. He suggested that the plan explore options for Federal funding of conflict resolution processes that are a direct result of the U.S. Geological Survey position on voting status of the Federal Representative. Mr. Fassett agreed that Federal funding should be an integral part of the mechanism.

Mr. Horak asked for a status report on the Sheridan Area Water Supply project. Mr. Fassett reported that the project involves development of a water-supply system designed to satisfy U.S. Environmental Protection Agency requirements to replace raw water delivery systems in the Sheridan area and to provide treated water to a large service area surrounding Sheridan. The project includes enlargement of two existing lakes (Twin Lakes) in the Big Goose Creek basin which requires a 404 permit from the Corps of Engineers. The Corps is concerned about 23 acres of wetlands that would be impacted by the project. The city is in a frustrating position because of the Environmental Protection Agency's court order to cease delivery of raw water and their inability to proceed without a 404 permit. The Corps is recommending that the city purchase water rights from agricultural water users.



Mr. Horak asked Montana to report on the Clarks Fork of the Yellowstone River Temporary Preliminary Decree. Mr. Arrington stated that the decree was issued on June 9, 1993 and involved 2,577 claims for water rights. The original decree set a deadline of December 6, 1993 for filing objections. The deadline has since been extended to March 4, 1994. The decree includes four water claims for diversions in Wyoming that have been adjudicated by Wyoming. The Montana Water Court will probably dismiss the Montana water claims in Wyoming. The decree also includes 10 claims for diversions in Montana that are used in Wyoming.

Mr. Fassett asked if the interstate water claims were ones that have been administered under the Compact Commission Interstate Ditch rules. Mr. Arrington stated that some were for water-flood projects in oil fields.

Ms. Lowry commented that she had discussed the decree with Mr. Chuck Dalby, Montana Department of Natural Resources and Conservation. She has requested information on the claims and asked to see copies of claims to the Water Court. Mr. Arrington agreed to send abstracts to the Wyoming State Engineer's Office for review. Mr. Horak asked that copies be sent to him for inclusion in the Compact Commission files.

Mr. Fassett asked if Montana Department of Natural Resources and Conservation made recommendations to the Montana Water Court on processing interstate water claims. Mr. Arrington noted that their role is simply to provide facts to the Court, not make recommendations. Mr. Fassett asked what action the Court would take on interstate claims. Mr. Arrington stated that the Court would probably dismiss the claims.

Mr. Fritz wondered if the Commission should send a letter to the Court describing the Interstate Ditch procedures. Mr. Fassett suggested that Wyoming should send the letter because Wyoming water claims are in question. Mr. Fritz agreed and added that he was concerned about his dual role in the issue. Mr. Fassett agreed to draft a letter to the Court but wondered why the claims had not been withdrawn. Mr. Arrington noted that the claims had been adjudicated in Wyoming under the provisions of the Compact Commission rules on Interstate Ditches and felt certain that the Montana Water Court would dismiss them. Mr. Fassett asked if Montana Department of Natural Resources and Conservation recommended dismissal of the claims. Mr. Fritz reaffirmed that they only present facts to the Court, not recommendations. Mr. Arrington offered to send documentation to Mr. Fassett for review.

Mr. Fassett inquired about funding for field investigations of water rights claims. Mr. Fritz responded that recent budget cuts in the Montana Department of Natural Resources and Conservation had eliminated four field positions which would result in an extension of the water-adjudication process of 3 to 5 years. He commented that the Water Court does not have funding to support field investigations which requires the Court to rely on the Department for field activities. Mr. Fassett commented that the courts in Wyoming also are asking his agency to provide assistance. He added that he has heard that Idaho is also experiencing funding problems with their adjudication process.

Mr. Horak asked Montana for an update on negotiations with the Crow Indian Reservation. Mr. Fritz reported that the negotiations are proceeding at a slow pace. Consensus has been reached that a Memorandum of Understanding will be prepared to outline the procedures and to compile and exchange information on available data and studies. Mr. Fassett asked to be kept informed and to provide him with a copy of the draft MOU.

Mr. Horak asked Wyoming to comment on the status of water rights issues on the Wind River Reservation. Mr. Fassett responded that the water rights quantification issues have been resolved but that the Governor and the tribal council are discussing issues related to water development and administration of tribal water rights. The tribes are requesting funding assistance from Wyoming to rehabilitate dams and irrigation facilities and enlarge existing structures. Both Wyoming and the tribes are seeking Federal dollars to fund water-development activities.



Mr. Fritz inquired about the dam-safety assistance Wyoming has been providing the tribes. He wanted to know if the assistance was in the form of funding or technical guidance. Mr. Fassett responded that the Bureau of Indian Affairs and the Bureau of Reclamation are providing technical assistance and the tribes are seeking both Wyoming Water Development and Federal funds for rehabilitation work.

Mr. Arrington, noting that Montana is dealing with Walton Rights issue on the Milk River, asked if Wyoming had a procedure to determine those rights.

Mr. Fassett responded that the Wyoming Supreme Court recognizes Walton Rights. Wyoming was faced with a wide range of claims for Walton Rights on the Wind River Reservation. Many creative ideas were developed to claim water using the Walton Right theory of law. Any land that had originally been a part of the reservation offered opportunity for Walton Right claims. Out of about 400 claims made, about 15 different theories were applied to justify the claims. A major issue revolved around the question of continuous use after the land had transferred from Indian to non-Indian ownership.

Mr. Arrington requested information from Wyoming on their experiences with Walton Right issues. Mr. Fassett noted that Wyoming and the tribes have resorted to joint field inspection of claims to eliminate questions about factual matters. He felt that this procedure would resolve many of the technical issues surrounding Walton Right claims.

Mr. Horak asked for an update on Congressional plans to protect geothermal resources in Yellowstone National Park. Mr. Fassett stated that a protection bill has passed in the House but no action has been taken in the Senate. Noting that Wyoming and Idaho are impacted by legislation that was designed primarily to address issues in Montana, he asked for information on the current status of the bill.

Mr. Fritz noted that the bill will be more controversial in the Senate. He stated that the bill was drafted in accordance with the Compact between Montana and the National Park Service. That Compact provides for a buffer zone around the Park where development activities will be monitored. The National Park Service has included funding in their budget to support monitoring activities to be conducted by Montana. He noted that Montana will begin to implement provisions of the Compact in the near future.

Mr. Fassett stated that Wyoming and Idaho are not supportive of the Federal protection zone in their States and asked if new water rights questions had arisen as a result of the negotiations between Montana and the National Park Service. Mr. Fritz expressed appreciation for the other State's concerns. Mr. Fassett observed that a bill to protect the natural wonders of Yellowstone National Park would receive considerable support but wondered if it was an overreaction to problems Montana has had with one well drilled by the Church Universal and Triumphant. Mr. Fritz stated that the well was only part of the issue. Mr. Fassett noted that the bill raises questions related to the "taking" of private rights and property by the Federal government.

Mr. Horak asked Wyoming for a status report on the Little Bighorn Pumped Hydro Project. Mr. Fassett stated that the project is proceeding slowly. The Federal Energy Regulatory Commission has judged the licensing application to be complete. However, many environmental questions remain regarding the proposed dam, location of transmission lines, and other physical facilities. Mr. Horak asked when FERC might make a decision. Mr. Fassett stated that a decision is far in the future. When asked if the financial supporters of the project have had experience with the FERC licensing process, Mr. Fassett noted that the company has developed similar projects in other areas including one in New Jersey. He asked if Montana has objected to the project. Mr. Moy stated that no formal objection has been raised by Montana at this point. They are waiting to see if FERC will require an Environmental Impact Statement before deciding whether to intervene. Mr. Fassett reiterated that FERC has deemed the application complete but that the developers are still looking for future customers willing to commit to long-term contracts for the power.



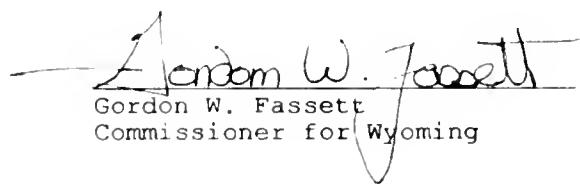
Mr. Horak asked Montana for an update on the Tongue River Reservoir project. Mr. Fritz reported that Montana is overseeing a contract for an Environmental Impact Statement, consulting with the Federal government on issuance of a 404 permit and NEPA compliance, and petitioning the Montana Water Court for a water rights decree. He noted that a Northern Cheyenne tribal member has filed an objection to the Compact, the \$11.5 million loan from the Northern Cheyenne Tribe is contingent on development of an agreement with the tribe for hiring preferences for jobs related to the project, and that a technical error in the legislation has prevented Montana from spending Federal funds until a decree has been entered by the Water Court. A technical correction bill has been approved by the Senate but is still awaiting action by the House.

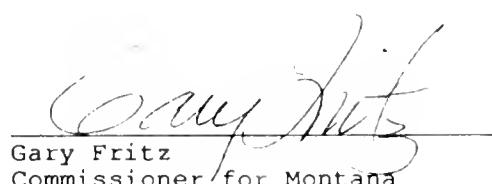
Ms. Lowry noted that the U.S. Geological Survey has announced that some water-quality monitoring stations in the Tongue River have been discontinued and asked for further information. Mr. Moreland reported that cuts in the Federal Collection of Basic Records program resulted in the elimination of a sediment station on the Powder River at Moorhead. The station had been operated as part of a geomorphology project for the U.S. Geological Survey National Research Program and, to his knowledge, was not of much interest to other parties. A chemical-quality monitoring station on the Tongue River at Birney Day School operated at the request of the Bureau of Indian Affairs has also been discontinued but other water-quality monitoring stations were still in operation at the mouths of both the Tongue and the Powder Rivers. Asked if the U.S. Geological Survey operated a water-quality monitoring site near the state line on the Tongue River, Mr. Moreland responded affirmatively.

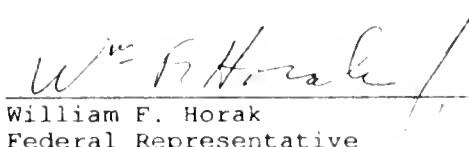
Mr. Horak asked if the Commission wished to pursue the issue of Compact administration. No comments were offered by Mr. Fassett or Mr. Fritz. Mr. Horak asked if Mr. Dalby had completed a draft report on administration issues of interest to Montana. Mr. Fritz stated that Montana wanted to have more internal discussion on the matter but had not had time to devote to the issue. Ms. Lowry noted that she had provided Mr. Dalby a number of permanent records on Wyoming water use and asked the whereabouts of the material. Mr. Fritz agreed to locate the material.

Mr. Horak noted that Wyoming would be the host of the next annual Yellowstone River Compact Commission meeting. Mr. Moy suggested that the Commission consider a workshop meeting in the spring of 1994 to address Compact administration and conflict resolution. Mr. Fassett stated that he would be agreeable to such a meeting and asked when Montana would like to schedule a workshop. Mr. Horak asked if the meeting would be a formal meeting of the Commission that would require attendance of the Federal Representative. Mr. Fritz thought the meeting could be an informal working meeting but that the Federal Representative would be welcome to participate. Mr. Fritz stated that the burden was on him to develop a format for the meeting and extend invitations.

Having no other business to discuss, the Commission adjourned the meeting at 11:15 a.m.

  
Gordon W. Fassett  
Commissioner for Wyoming

  
Gary Fritz  
Commissioner for Montana

  
William F. Horak  
Federal Representative



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GENERAL REPORT

Cost of operation and budget

The work funded by the Yellowstone River Compact Commission, which to date has been primarily concerned with the collection of required hydrologic data, has been financed through cooperative arrangements whereby Montana and Wyoming each bear one-fourth of the cost and the remaining one-half is borne by the United States. The salaries and necessary expenses of the State and U.S. Geological Survey representatives, and the cost to other agencies of collecting hydrologic data, are not considered as expenses of the Commission.

The expense of the Commission during fiscal year 1993 was \$42,900, in accordance with the budget adopted for the year.

The budgets for fiscal years 1994, 1995, and 1996 were tentatively adopted subject to the availability of appropriations.

The budgets for the four fiscal years are summarized as follows:

October 1, 1992, to September 30, 1993 (fiscal year 1993):

Continuation of existing stream-gaging programs	\$42,900
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October 1, 1993, to September 30, 1994 (fiscal year 1994):

Continuation of existing stream-gaging programs	\$45,200
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October 1, 1994, to September 30, 1995 (fiscal year 1995):

Estimate of continuation of existing stream-gaging programs	\$47,500
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October 1, 1995, to September 30, 1996 (fiscal year 1996):

Estimate of continuation of existing stream-gaging programs and relocation of Tongue River gage	\$64,800
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Stream-gaging-station operation

Gaging stations at the measuring sites specified in the Yellowstone River Compact were continued in operation and satisfactory discharge records were collected at each station. Locations of gaging and reservoir stations are shown on a map of the Yellowstone River Basin at the end of the report.

During water year 1993, annual streamflow was greater than normal<sup>1</sup> in one of the four tributaries of the Yellowstone River as given in the following table:

<u>Station number</u>	<u>Measurement site</u>	<u>Percent of average</u>
06208500	Clarks Fork Yellowstone River at Edgar, Mont., minus diversions to White Horse Canal	92
06294500	Bighorn River above Tullock Creek, near Bighorn, Mont., minus Little Bighorn River near Hardin, Mont. Adjusted for change in contents in Bighorn Lake	86
06308500	Tongue River at Miles City, Mont.	116
06326500	Powder River near Locate, Mont.	130

Tabulation of streamflow data for water year 1993 and graphical comparisons with average flows for the preceding year and for selected base periods are given in the section "Summary of discharge for Compact stream-gaging stations."



### Divisions

No diversions were regulated by the Commission during the year. The Commissioners considered the need to develop procedures to administer water in accordance with the provisions of the Compact.

### Storage in reservoirs

#### Reservoirs completed after January 1, 1950

Bighorn Lake, a U.S. Bureau of Reclamation project on the Bighorn River, and the largest storage project in the basin, contained 1,026,000 acre-feet at the beginning of the year and 1,039,000 acre-feet at the end of the year. It fluctuated from 799,800 acre-feet on May 2, 1993, to 1,100,000 acre-feet on July 7, 1993. Boysen Reservoir, located on the Wind River and operated by the U.S. Bureau of Reclamation, began the year with 525,500 acre-feet in storage and ended the year with 677,200 acre-feet. Storage figures are listed as usable acre-feet. Monthend and yearend contents and a description of these reservoirs are given in the section "Monthly summary of contents for Compact reservoirs completed after January 1, 1950." The Commission is cognizant of other reservoirs in the Yellowstone River basin and considers their aggregate effect to be insufficient to warrant the collection of storage data at this time.

#### Reservoirs existing on January 1, 1950

As a matter of record and general information, monthend storage data are given later in the report for reservoirs in existence upstream from the points of measurement on January 1, 1950. These data are pertinent to allocation under Article V, Section C, Item 3 of the Compact.

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<sup>1</sup> The "normal" range is 80 to 120 percent of average.



## SUMMARY OF DISCHARGE FOR COMPACT STREAM-GAGING STATIONS

06208500 Clarks Fork Yellowstone River at Edgar, Mont.

LOCATION.--Lat  $45^{\circ}27'58''$ , long  $108^{\circ}50'35''$ , in SE1/4SE1/4SE1/4 sec.23, T.4 S., R.23 E., Carbon County, Hydrologic Unit 10070006, on right bank 400 ft downstream from county bridge, 0.5 mi east of Edgar, 6 mi upstream from Rock Creek, and at river mile 22.1.

DRAINAGE AREA.--2,032 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1921 to September 1969, October 1986 to current year.

REVISED RECORDS.--WSP 1509: 1924, 1932(M). WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,460 ft above sea level, from topographic map. Prior to Aug. 31, 1953, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Nov. 23 to Mar. 13. Records good except those for estimated daily discharges, which are poor. Diversions for irrigation of about 41,500 acres, of which about 840 acres are downstream from the station. In addition, about 6,300 acres of land upstream from the station are irrigated by diversions from the adjoining Rock Creek basin. Several observations of water temperature and specific conductance were made during the year. Figures of discharge given herein have been adjusted to exclude the flow of White Horse Canal, which diverts water 5.3 mi downstream from station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	510	566	e450	e300	e400	e400	371	462	3850	2080	1660	349
2	492	562	e430	e400	e400	e420	362	469	3800	1790	1570	334
3	482	570	e370	e350	e400	e450	362	487	3500	2010	1330	330
4	479	559	e300	e350	e400	e480	384	550	2940	3090	1130	308
5	515	546	e350	e330	e400	e540	364	823	2320	2580	1000	323
6	514	509	e400	e320	e390	e580	369	894	2110	2240	1050	335
7	549	550	e450	e310	e380	e660	362	1300	2300	2150	1090	278
8	576	555	e480	e320	e370	e660	351	1240	2640	1960	1150	218
9	562	562	e500	e290	e360	e600	356	1040	2440	1760	1080	184
10	572	566	e500	e260	e350	e560	369	929	2220	1610	994	178
11	552	553	e500	e270	e360	e450	390	1010	2350	1680	953	187
12	537	511	e470	e280	e370	e320	388	1660	3000	1710	970	230
13	547	543	e430	e230	e380	e340	399	2370	2890	1620	1010	306
14	557	594	e440	e270	e370	351	370	3130	2450	1530	1060	335
15	616	594	e450	e330	e330	379	361	3890	2390	1410	968	346
16	627	580	e400	e350	e280	366	343	4430	3080	1410	881	351
17	603	582	e380	e350	e250	339	343	4470	3410	1350	783	355
18	599	553	e350	e330	e280	327	356	4120	3060	1310	666	374
19	610	564	e350	e350	e310	350	391	3930	2680	1230	557	402
20	589	555	e400	e370	e300	358	399	4020	2920	1050	487	413
21	580	527	e450	e400	e300	359	377	4800	3520	1030	516	430
22	565	494	e430	e380	e290	350	379	5330	3810	1070	554	448
23	544	e460	e430	e370	e290	347	423	4610	3490	1140	652	456
24	537	e430	e450	e350	e300	352	463	3520	2740	1320	599	463
25	531	e410	e470	e390	e310	360	430	2740	2030	2010	552	467
26	527	e430	e480	e420	e320	381	413	2650	1620	1830	541	478
27	538	e480	e430	e450	e330	425	394	3470	1720	1800	530	496
28	523	e500	e330	e430	e370	442	390	4230	2090	1710	469	476
29	528	e480	e270	e400	---	448	381	4470	2570	1500	430	431
30	538	e450	e230	e420	---	417	419	4130	2530	1430	457	424
31	550	---	e200	e410	---	386	---	3770	---	1550	423	---
TOTAL	17049	15835	12570	10780	9590	13197	11459	84944	82470	51960	26112	10705
MEAN	550	528	405	348	342	426	382	2740	2749	1676	842	357
MAX	627	594	500	450	400	660	463	5330	3850	3090	1660	496
MIN	479	410	200	230	250	320	343	462	1620	1030	423	178
AC-FT	33820	31410	24930	21380	19020	26180	22730	168500	163600	103100	51790	21230

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1921 - 1993, BY WATER YEAR (WY)

MEAN	535	502	406	356	354	363	554	2096	4019	2039	632	496
MAX	1010	777	583	779	616	554	1398	5578	6843	4771	1541	1395
(WY)	1942	1928	1951	1970	1970	1943	1943	1928	1927	1943	1951	1941
MIN	298	310	217	200	180	220	123	757	1768	290	49.5	156
(WY)	1956	1936	1937	1922	1922	1924	1961	1968	1987	1988	1988	1988

SUMMARY STATISTICS		FOR 1992 CALENDAR YEAR			FOR 1993 WATER YEAR			WATER YEARS 1921 - 1993*		
ANNUAL TOTAL		382081			346671			1028		
ANNUAL MEAN		1044			950			1558		
HIGHEST ANNUAL MEAN										1943
LOWEST ANNUAL MEAN								668		1988
HIGHEST DAILY MEAN		6290	Jun 16		5330	May 22		10600	Jun 2	1936
LOWEST DAILY MEAN		200	Dec 31		178	Sep 10		37	May 11	1961
ANNUAL SEVEN-DAY MINIMUM		220	Aug 14		226	Sep 7		43	Apr 18	1961
INSTANTANEOUS PEAK FLOW					5660	May 21		10900a	Jun 2	1936
INSTANTANEOUS PEAK STAGE					6.85	May 21		8.66	Jun 6	1991
INSTANTANEOUS LOW FLOW					157	Sep 9		36	Apr 22	1961
ANNUAL RUNOFF (AC-FT)		757900			687600			745100		
10 PERCENT EXCEEDS		3180			2570			2820		
50 PERCENT EXCEEDS		513			480			470		
90 PERCENT EXCEEDS		335			329			275		

\*--During period of operation (1921-69, 1987 to current year).

a--Gage height, 8.62 ft.

e--Estimated.



CLARKS FORK YELLOWSTONE RIVER AT EDGAR, MONT.  
(Minus diversions to White Horse Canal)

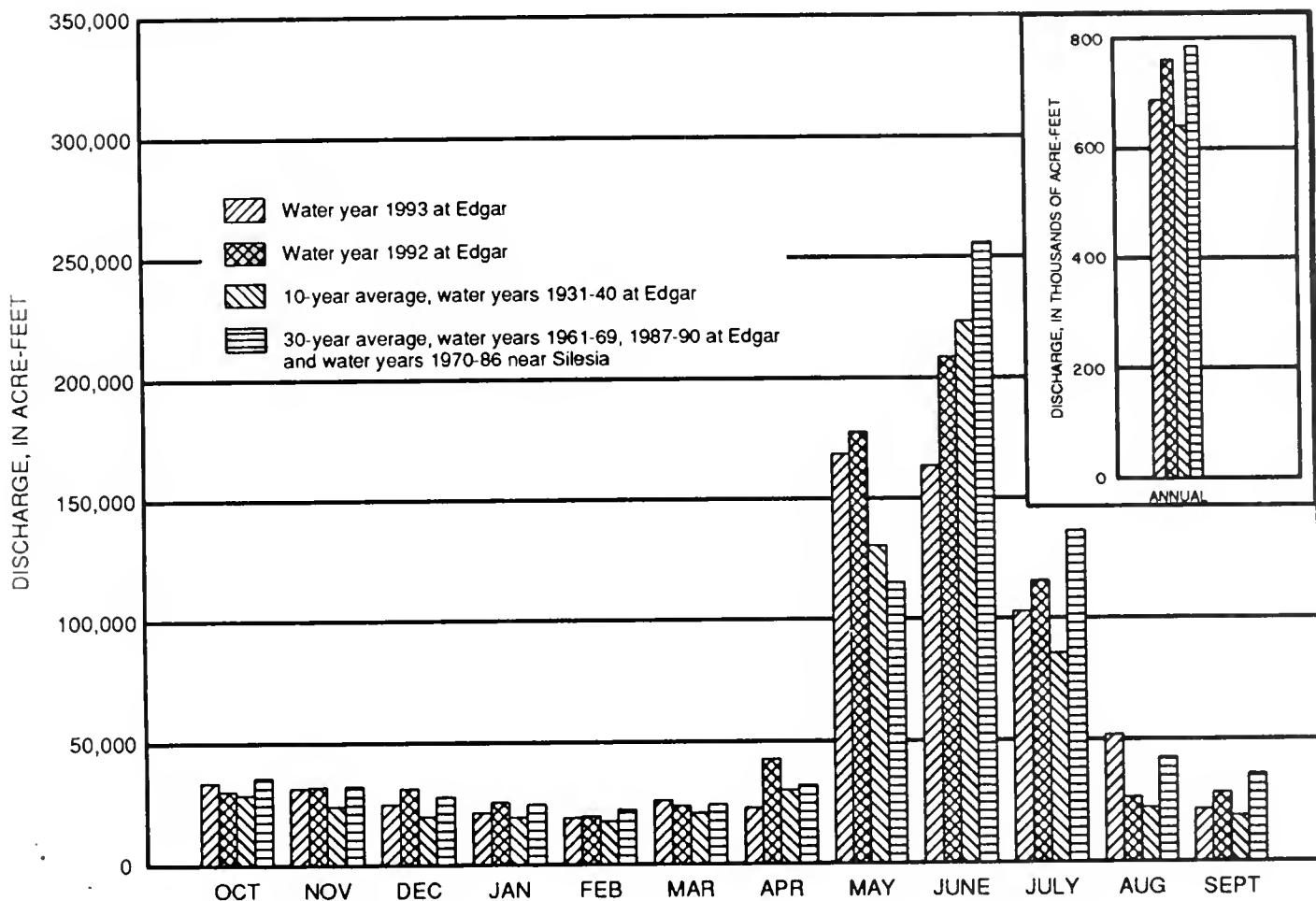


Figure 1.--Comparison of discharge of the Clarks Fork Yellowstone River during water year 1993 with discharge during water year 1992 and with 10-year and 30-year average discharges.



LOCATION.--Lat 45°44'09", long 107°33'24", in SE1/4NE1/4NE1/4 sec.19, T.1 S., R.34 E., Big Horn County, Hydrologic Unit 10080016, on left bank 50 ft downstream from bridge on Sarpy Road, 0.2 mi upstream from terminal wastewater of Agency Canal, 2.3 mi east of Hardin, and at river mile 0.6.

DRAINAGE AREA.--1,294 mi<sup>2</sup>.

PERIOD OF RECORD.--June 1953 to current year.

REVISED RECORDS.--WDR MT-86-1: 1978.

GAGE.--Water-stage recorder. Datum of gage is 2,882.29 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to Oct. 7, 1953, nonrecording gage at site 0.4 mi downstream. Oct. 7, 1953, to May 6, 1963, water-stage recorder at site 0.3 mi downstream. May 6, 1963, to Nov. 6, 1963, nonrecording gage at site 0.4 mi downstream. All at different datums. Nov. 7, 1963, to Aug. 15, 1976, water-stage recorder at site 35 ft downstream at present datum. Aug. 15, 1976, to Sept. 30, 1979, water-stage recorders were located on each bank downstream from Sarpy Road bridge and were used depending on control conditions.

REMARKS.--Estimated daily discharges: Dec. 4 to Mar. 24. Records good except those for estimated daily discharges, which are poor. Flow partly regulated by Willow Creek Reservoir (capacity 23,000 acre-ft). Diversions for irrigation of 20,980 acres upstream from station. Figures of discharge given herein include flow of terminal wastewater of Agency Canal. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	120	125	184	e70	e150	e110	197	203	419	369	281	190
2	118	130	162	e90	e140	e130	185	336	394	313	267	182
3	117	131	163	e110	e110	e150	179	289	412	318	247	181
4	112	149	e110	e110	e130	e220	172	246	443	499	228	182
5	111	152	e100	e90	e130	e270	164	232	407	613	237	195
6	110	141	e110	e100	e150	e370	161	241	378	593	231	199
7	116	147	e130	e90	e160	e370	160	327	389	549	226	203
8	119	154	e150	e90	e140	e350	160	513	477	547	225	207
9	124	159	e170	e90	e120	e320	157	440	840	513	223	201
10	118	174	e200	e80	e110	e250	155	386	1140	494	204	193
11	120	182	e190	e80	e100	e200	160	345	870	477	156	191
12	115	169	e170	e80	e120	e150	174	313	787	474	155	192
13	114	151	e150	e70	e140	e150	192	325	736	469	164	200
14	121	145	e130	e70	e130	e200	215	383	679	444	188	208
15	146	142	e130	e90	e110	e250	227	488	618	437	196	202
16	154	151	e120	e110	e100	e200	205	561	596	431	187	187
17	158	151	e100	e110	e90	e210	185	625	606	474	187	188
18	150	151	e80	e100	e80	e250	176	680	665	524	193	181
19	154	148	e100	e100	e110	e300	176	663	650	377	198	180
20	154	145	e120	e110	e100	e250	175	627	581	344	206	180
21	149	143	e120	e100	e270	179	628	539	330	204	175	
22	141	138	e110	e120	e100	e300	185	652	504	362	197	168
23	137	135	e120	e110	e100	e300	195	728	483	400	193	168
24	134	148	e120	e90	e90	e270	213	694	475	391	196	174
25	134	108	e120	e90	e90	255	211	568	458	392	190	175
26	133	115	e120	e100	e80	243	214	474	449	457	175	164
27	136	144	e90	e100	e90	231	194	440	433	548	175	163
28	131	173	e60	e105	e100	224	182	488	397	512	187	164
29	131	165	e56	e120	---	221	178	529	388	486	188	163
30	123	144	e54	e140	---	213	184	507	375	367	187	170
31	123	---	e50	e150	---	205	---	474	---	315	190	---
TOTAL	4023	4410	3789	3085	3170	7432	5510	14405	16588	13819	6281	5526
MEAN	130	147	122	99.5	113	240	184	465	553	446	203	184
MAX	158	182	200	150	160	370	227	728	1140	613	281	208
MIN	110	108	50	70	80	110	155	203	375	313	155	163
AC-FT	7980	8750	7520	6120	6290	14740	10930	28570	32900	27410	12460	10960

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1954 - 1993, BY WATER YEAR (WY)

MEAN	155	156	136	145	216	334	330	629	858	283	123	133
MAX	276	248	223	366	610	987	748	2852	1981	1333	382	267
(WY)	1979	1979	1979	1975	1971	1972	1965	1978	1968	1975	1975	1978
MIN	67.6	84.6	68.7	71.6	70.3	92.7	54.8	71.9	117	8.50	2.46	19.1
(WY)	1957	1986	1962	1988	1989	1961	1961	1961	1961	1961	1961	1960

SUMMARY STATISTICS			FOR 1992 CALENDAR YEAR			FOR 1993 WATER YEAR			WATER YEARS 1954 - 1993		
ANNUAL TOTAL		71401			88038						
ANNUAL MEAN		195			241					291	
HIGHEST ANNUAL MEAN										676	
LOWEST ANNUAL MEAN										70.4	
HIGHEST DAILY MEAN		601	Jul 4		1140		Jun 10		15800		May 20 1978
LOWEST DAILY MEAN		50	Dec 31		50		Dec 31		.30		Aug 5 1961
ANNUAL SEVEN-DAY MINIMUM		79	Dec 25		67		Dec 27		.40		Aug 3 1961
INSTANTANEOUS PEAK FLOW					1260		Jun 10		22600a		May 19 1978
INSTANTANEOUS PEAK STAGE					6.03t		Mar 9		11.78c		Mar 20 1960
INSTANTANEOUS LOW FLOW									.20d		Aug 7 1961
ANNUAL RUNOFF (AC-FT)		141600			174600				211100		
10 PERCENT EXCEEDS		348			496				638		
50 PERCENT EXCEEDS		153			180				168		
90 PERCENT EXCEEDS		115			100				78		

a--Gage height, 11.20 ft.

b--Backwater from ice.

c--Site and datum then in use, backwater from ice.

d--Result of discharge measurement.

e--Estimated.



LOCATION.--Lat 46°07'29", long 107°28'06", in SE1/4SE1/4NE1/4 sec.3, T.4 N., R.34 E., Treasure County, Hydrologic Unit 100H0015, on right bank, 1.9 mi upstream from Tullock Creek, 3.6 mi southwest of Bighorn, 4.5 mi southeast of Custer, and at river mile 3.0.

DRAINAGE AREA.--22,414 mi<sup>2</sup>. Area at site used Oct. 7, 1955, to Sept. 30, 1981, 22,885 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1981 to current year. Previously published as "06294700 Bighorn River at Bighorn, MT" 1956-81, and as "near Custer" 1945-55. Flows are equivalent at all sites.

GAGE.--Water-stage recorder. Elevation of gage is 2,700 ft above sea level, from topographic map. May 11, 1945 to Dec. 6, 1945, nonrecording gage, and Dec. 7, 1945, to Oct. 6, 1955, water-stage recorder 1.7 mi upstream at different datum. Oct. 7, 1955, to Sept. 30, 1981, at site 2.3 mi downstream at different datum.

REMARKS.--Estimated daily discharges: Dec. 19, 20, Dec. 30 to Jan. 31, Feb. 16 to Mar. 5. Records good. Flow regulated by Bighorn Lake beginning November 1965 (usable capacity, 1,356,000 acre-ft). Major regulation prior to November 1965 by 14 reservoirs in Wyoming and 1 in Montana with combined usable capacity of about 1,400,000 acre-ft. Diversion for irrigation of about 445,200 acres upstream from station. U.S. Army Corps of Engineers satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2230	2120	3180	e2300	2420	e2000	2250	2480	3020	7390	4090	2680
2	2150	2120	3170	e2800	2300	e2000	2250	2680	3010	7400	3970	2650
3	2080	2220	3200	e2600	2290	e2100	2220	2780	3020	7840	3900	2640
4	2060	2710	3180	e2600	2320	e2200	2210	2550	3090	9460	3840	2620
5	2040	2710	3130	e2500	2310	e2400	2200	2540	3120	10000	3790	2610
6	2030	2730	3130	e2500	2300	2580	2180	2580	3070	9930	3700	2630
7	2090	2820	3150	e2500	2320	2920	2180	2690	3210	9030	3670	2560
8	2060	3080	3180	e2400	2350	3110	2180	2930	3780	8980	3650	2570
9	2320	3110	3250	e2300	2340	3080	2160	3290	4020	8770	3570	2510
10	2380	3090	3270	e2300	2330	2920	2170	3350	4930	8710	3290	2450
11	2320	3120	3300	e2400	2310	2810	2170	3320	4690	8630	2900	2430
12	2290	3120	3340	e2500	2000	2620	2320	3220	4540	8550	2870	2440
13	2250	3100	3350	e2700	1990	2420	2430	3180	4400	8350	2930	2440
14	2260	3110	3340	e2900	1980	2360	2530	3140	4300	7970	3010	2410
15	2240	3100	3380	e3300	1960	2430	2410	3190	4370	7580	3030	2380
16	2310	3110	3380	e3300	e1900	2390	2320	3440	4680	7010	2960	2340
17	2300	3110	3360	e3200	e1800	2310	2250	3490	4770	6500	2930	2320
18	2220	3120	3390	e3200	e1700	2510	2240	3430	4830	6420	2910	2310
19	2170	3130	e3400	e3200	e1900	3130	2280	3480	5430	5850	2910	2300
20	2160	3130	e3400	e3300	e1900	3400	2240	3450	5720	5350	2920	2300
21	1970	3120	3430	e3300	e1800	3560	2250	3350	5630	4590	2940	2280
22	1210	3150	3420	e3200	e1800	3590	2290	3260	5720	4270	2920	2410
23	2130	3150	2860	e3100	e1900	3510	2320	3140	6150	4150	2860	2730
24	2150	3120	2840	e2900	e1800	2930	2360	3100	6700	4240	2700	3000
25	2130	3080	2850	e2800	e1900	2610	2370	2990	6960	4150	2670	3010
26	2120	3060	2860	e3100	e1900	2370	2400	2970	7140	4340	2650	3120
27	2140	3100	2880	e2900	e1900	2340	2380	2890	7610	6100	2590	3110
28	2120	3140	2860	e2700	e1900	2340	2370	2970	7680	5790	2650	3200
29	2110	3150	3010	e2600	---	2340	2350	3040	7620	4980	2660	3280
30	2110	3130	e2300	e2600	---	2300	2410	3080	7550	4400	2720	3290
31	2110	---	e2000	e2500	---	2270	---	3070	---	4230	2690	---
TOTAL	66260	89060	96790	86500	57620	81850	68690	95070	150760	210960	96890	79020
MEAN	2137	2969	3122	2790	2058	2640	2290	3067	5025	6805	3125	2634
MAX	2380	3150	3430	3300	2420	3590	2530	3490	7680	10000	4090	3290
MIN	1210	2120	2000	2300	1700	2000	2160	2480	3010	4150	2590	2280
AC-FT	131400	176700	192000	171600	114300	162300	136200	188600	299000	418400	192200	156700

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1993, BY WATER YEAR (WY)

MEAN	3225	3361	3192	3043	3201	3734	3471	4381	7063	5324	2766	2803
MAX	5546	5599	4907	5478	5314	6580	7203	9102	15180	19090	6567	4952
(WY)	1972	1974	1968	1968	1971	1972	1972	1947	1948	1967	1978	1973
MIN	1391	1223	1280	1382	1843	908	1063	1304	1050	707	868	1009
(WY)	1990	1978	1961	1966	1966	1966	1966	1966	1966	1960	1961	1966

SUMMARY STATISTICS FOR 1992 CALENDAR YEAR FOR 1993 WATER YEAR WATER YEARS 1946 - 1993

ANNUAL TOTAL	1034220		1179470									
ANNUAL MEAN	2826		3231									
HIGHEST ANNUAL MEAN												
LOWEST ANNUAL MEAN												
HIGHEST DAILY MEAN	3950	Jul 24		10000	Jul 5							
LOWEST DAILY MEAN	1210	Oct 22		1210	Oct 22							
ANNUAL SEVEN-DAY MINIMUM	1980	Oct 21		1830	Feb 16							
INSTANTANEOUS PEAK FLOW				10400	Jul 5							
INSTANTANEOUS PEAK STAGE					6.94b	Jan 15						
INSTANTANEOUS LOW FLOW							14.21b	Apr 2	1965			
ANNUAL RUNOFF (AC-FT)	2051000		2339000							2751000		
10 PERCENT EXCEEDS	3520		4870							6200		
50 PERCENT EXCEEDS	2680		2880							3200		
90 PERCENT EXCEEDS	2250		2130							1800		



## SUMMARY STATISTICS

WATER YEARS 1946 - 1961\*

WATER YEARS 1967 - 1993\*\*

ANNUAL MEAN	3558			
HIGHEST ANNUAL MEAN	5501	1947	3900	
LOWEST ANNUAL MEAN	1623	1961	5415	1975
HIGHEST DAILY MEAN	25700	Jun 23 1947	1999	1989
LOWEST DAILY MEAN	462	May 12 1961	50000	May 20 1978
ANNUAL SEVEN-DAY MINIMUM	528	May 6 1961	400	Apr 4 1967
INSTANTANEOUS PEAK FLOW	26200c	Jun 24 1947	843	Nov 18 1977
INSTANTANEOUS PEAK STAGE	10.65b	Mar 20 1947	59200	May 20 1978
INSTANTANEOUS LOW FLOW	275d	Nov 15 1959	14.15	May 20 1978
ANNUAL RUNOFF (AC-FT)	2578000		2825000	
10 PERCENT EXCEEDS	6200		6130	
50 PERCENT EXCEEDS	2810		3470	
90 PERCENT EXCEEDS	1500		2030	

\*--Prior to construction of Yellowtail Dam.

\*\*--After completion of Yellowtail Dam.

a--Gage height, 14.15 ft.

b--Rackwater from ice.

c--Gage height, 8.79 ft.

d--About, result of freezeup.

e--Estimated.



BIGHORN RIVER ABOVE TULLOCK CREEK, NEAR BIGHORN, MONT.  
 (Adjusted for change in contents in Bighorn Lake  
 minus  
 Little Bighorn River near Hardin, Mont.)

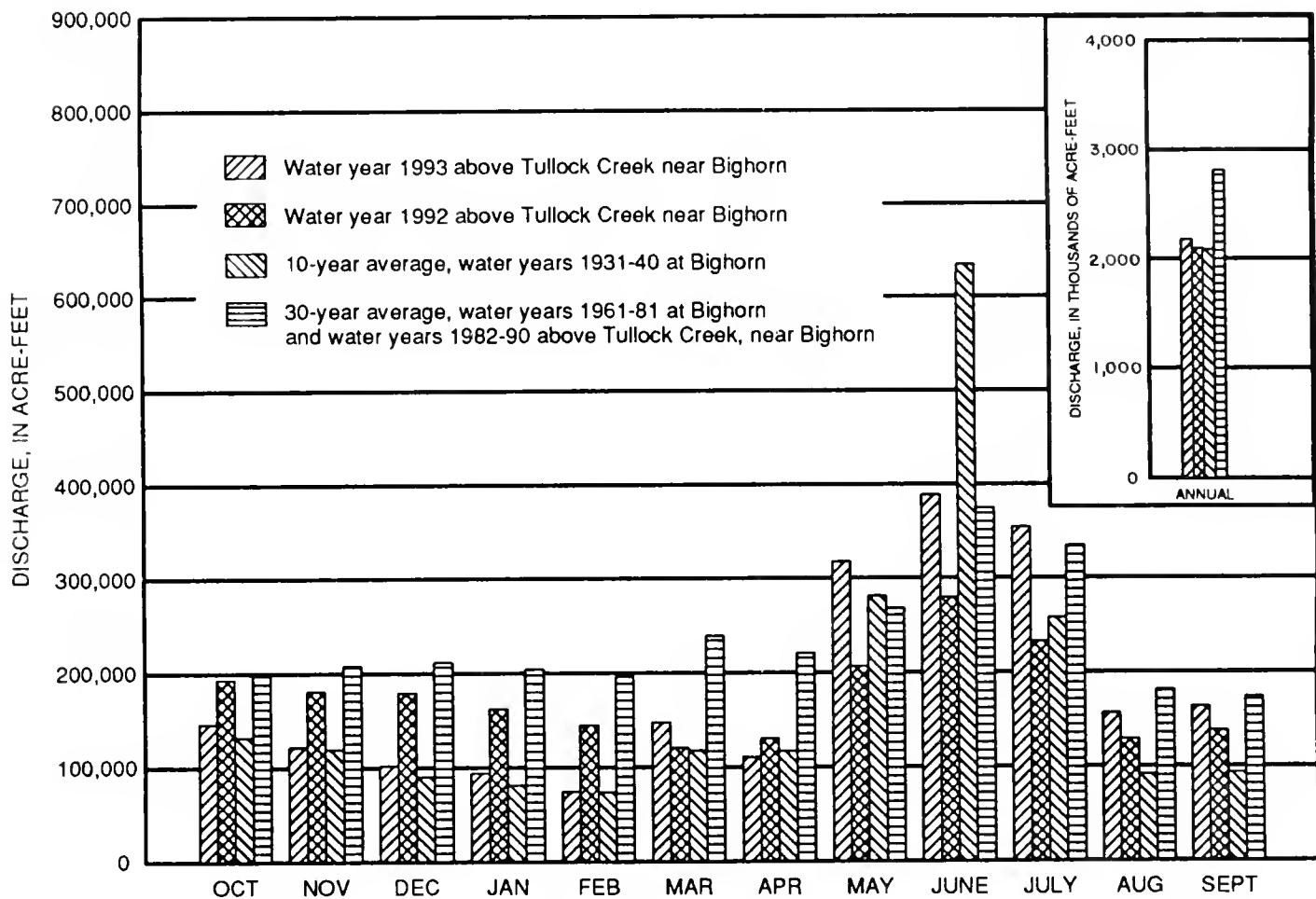


Figure 2.--Comparison of discharge of the Bighorn River during water year 1993 with discharge during water year 1992 and with 10-year and 30-year average discharges.



## 06308500 Tongue River at Miles City, Mont.

LOCATION.--Lat  $46^{\circ}20'44''$ , long  $105^{\circ}48'10''$ , in NE1/4NE1/4SE1/4 sec.23, T.7 N., R.47 E., Custer County, Hydrologic Unit 10090102, on right bank 4 mi south of Miles City, and at river mile 8.1.

DRAINAGE AREA.--5,379 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1938 to April 1942, April 1946 to current year. Published as "near Miles City" April 1938 to April 1942. Not equivalent to records published as "near Miles City" May 1929 to October 1932.

Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,375.76 ft above sea level (levels by U.S. Army Corps of Engineers). April 1938 to April 1942, nonrecording gage at site 8 mi upstream at different datum. April 1946 to Sept. 30, 1963, at datum 1.00 ft higher.

REMARKS.--Estimated daily discharges: Nov. 23 to Mar. 10, Mar. 15, 16, May 29 to June 2. Records good except those for estimated daily discharges, which are poor. Flow regulation by Tongue River Reservoir (station 06307000), and many small reservoirs in Wyoming (combined capacity about 15,000 acre-ft). Diversions for irrigation of about 100,800 acres upstream from station. U. S. Army Corps of Engineers satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	377	298	e170	e140	e280	e300	278	195	e1000	896	610	327
2	371	292	e160	e160	e280	e400	271	173	e1000	572	570	331
3	361	300	e120	e150	e280	e500	265	157	996	1440	542	331
4	361	303	e100	e140	e280	e700	261	148	1020	6140	527	333
5	422	303	e150	e160	e280	e1500	259	145	1090	3870	521	335
6	369	303	e250	e180	e270	e2000	255	162	1210	1320	525	337
7	439	303	e300	e200	e250	e2500	255	167	1460	884	581	283
8	428	302	e300	e180	e230	e2000	255	144	4400	710	513	228
9	349	311	e300	e170	e210	e1200	250	140	2470	636	495	205
10	214	370	e280	e150	e190	e900	248	134	809	593	486	182
11	206	337	e230	e150	e200	739	248	123	533	520	480	174
12	200	310	e210	e150	e200	613	248	102	507	912	470	170
13	191	303	e210	e170	e190	509	248	74	1260	2080	468	169
14	190	300	e230	e200	e180	453	263	46	1640	764	450	166
15	184	300	e250	e200	e170	e450	254	3.7	1420	541	422	164
16	178	300	e220	e190	e160	e400	246	77	1250	488	398	167
17	174	297	e180	e180	e150	411	245	343	1250	657	363	175
18	178	296	e150	e180	e160	480	247	369	1280	543	354	175
19	183	296	e170	e190	e170	646	440	386	1290	667	344	176
20	199	296	e180	e220	e170	486	478	391	1280	516	326	179
21	197	296	e200	e240	e170	571	318	578	1290	461	329	181
22	206	295	e200	e230	e170	553	256	1050	1270	1010	350	179
23	216	e250	e180	e230	e160	498	254	1200	1280	1380	341	176
24	216	e200	e200	e230	e150	422	241	1250	1290	772	318	182
25	216	e140	e220	e250	e140	398	235	1280	1280	582	290	214
26	216	e100	e200	e290	e150	344	233	1270	1270	520	298	216
27	216	e110	e180	e300	e180	311	234	1310	1260	1620	314	210
28	216	e110	e150	e270	e250	309	226	1280	1250	4040	303	207
29	216	e120	e130	e230	---	298	223	e1280	1310	1400	309	206
30	216	e140	e120	e220	---	291	219	e1200	1340	838	320	206
31	233	---	e130	e290	---	289	---	e1000	---	687	326	---
TOTAL	7938	7881	6070	6240	5670	21471	7953	16177.7	40005	38059	12943	6584
MEAN	256	263	196	201	202	693	265	522	1333	1228	418	219
MAX	439	370	300	300	280	2500	478	1310	4400	6140	610	337
MIN	174	100	100	140	140	289	219	3.7	507	461	290	164
AC-FT	15750	15630	12040	12380	11250	42590	15770	32090	79350	75490	25670	13060

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 1993, BY WATER YEAR (WY)

MEAN	245	260	197	197	279	540	452	719	1312	483	186	204
MAX	694	585	423	502	1794	1783	1693	2983	3825	2207	700	599
(WY)	1972	1942	1950	1975	1971	1971	1965	1978	1978	1975	1975	1968
MIN	10.3	60.9	68.0	78.6	102	79.8	12.5	29.2	48.6	12.6	6.08	2.40
(WY)	1961	1989	1990	1961	1961	1961	1961	1961	1960	1960	1949	1938

## SUMMARY STATISTICS FOR 1992 CALENDAR YEAR FOR 1993 WATER YEAR WATER YEARS 1938 - 1993\*

ANNUAL TOTAL	112710.9		176991.7									
ANNUAL MEAN	308		485							419		
HIGHEST ANNUAL MEAN										986		1978
LOWEST ANNUAL MEAN										57.2		1961
HIGHEST DAILY MEAN	1420	Jul 6	6140	Jul 4					9290		Jun 15	1962
LOWEST DAILY MEAN	2.1	May 30	3.7	May 15					.00		Jul 9	1940
ANNUAL SEVEN-DAY MINIMUM	14	May 25	80	May 10					.00		Jul 9	1940
INSTANTANEOUS PEAK FLOW			6530	Jul 4					13300a		Jun 15	1962
INSTANTANEOUS PEAK STAGE			9.07	Jul 4					13.27b		Mar 19	1960
INSTANTANEOUS LOW FLOW									.00c		Jul 9	1940
ANNUAL RUNOFF (AC-FT)	223600		351100						303800			
10 PERCENT EXCEEDS	650		1250						978			
50 PERCENT EXCEEDS	237		290						230			
90 PERCENT EXCEEDS	103		159						70			

\*--1938, 1942-46 not used in computations, incomplete water years.

a--Gage height, 12.33 ft, from rating curve extended above 8,200 ft<sup>3</sup>/s on basis of float measurement.

b--Ice jam.

c--Also occurred on several other days in 1940.

\*\*--Estimated.



## TONGUE RIVER AT MILES CITY, MONT.

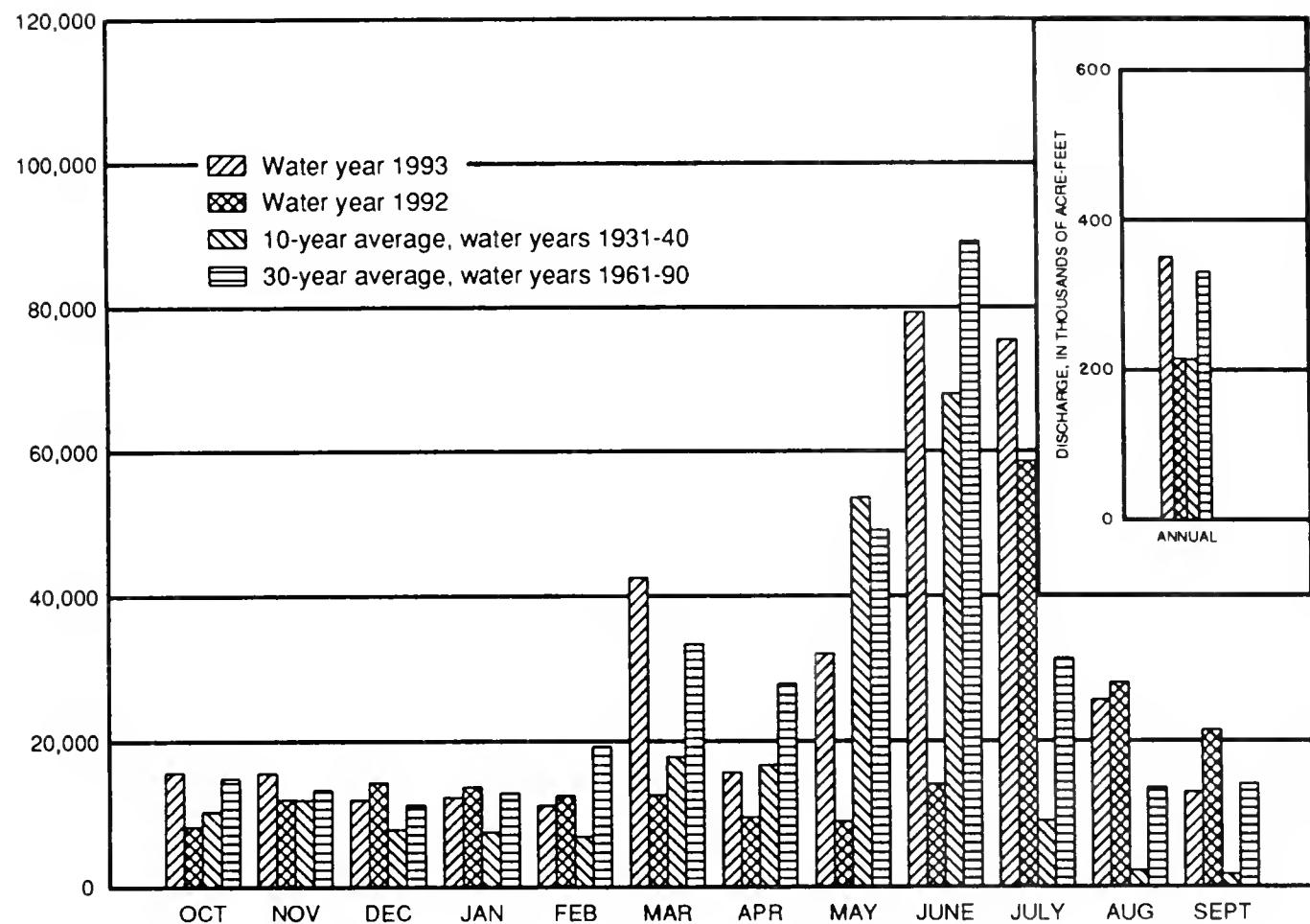


Figure 3.--Comparison of discharge of the Tongue River during water year 1993 with discharge during water year 1992 and with 10-year and 30-year average discharges.



LOCATION.--Lat 46°26'56", long 105°18'44", in NW1/4SW1/4 sec.14, T.8 N., R.51 E., Custer County, Hydrologic Unit 10090209, on left bank 1.5 mi downstream from bridge on old U.S. Highway 12 at present site of Locate, 1.5 mi upstream from Locate Creek, 5 mi west of former site of Locate, 25 mi east of Miles City, and at river mile 27.9.

DRAINAGE AREA.--13,194 mi<sup>2</sup>. Drainage area of site 1.5 mi upstream, 13,189 mi<sup>2</sup>.

PERIOD OF RECORD.--March 1938 to current year.

REVISED RECORDS.--WSP 926: 1939. WSP 1309: 1938-39 (M). WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,384.79 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to July 11, 1947, nonrecording gage at bridge 1.5 mi upstream, and July 11, 1947, to Sept. 30, 1965, water-stage recorder at site near upstream bridge at different datum. Oct. 1, 1965, to Oct. 4, 1966, nonrecording gage, and Oct. 5, 1966, to Mar. 21, 1978, water-stage recorder at present site and datum. Mar. 22, 1978, to Apr. 23, 1981, water-stage recorder 1.5 mi upstream at different datum, Apr. 24 to Aug. 20, 1981, water-stage recorder at present site and datum, and Aug. 21, 1981, to Sept. 30, 1981, water-stage recorder 1.5 mi upstream at different datum.

REMARKS.--Estimated daily discharges: Dec. 3 to Mar. 9. Records fair except those for estimated daily discharges, which are poor. Some regulation by three reservoirs in Wyoming with combined usable capacity of 36,800 acre-ft. Diversions for irrigation of about 101,800 acres upstream from station. U.S. Army Corps of Engineers satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	148	206	59	e45	e130	e400	834	406	1990	1510	857	314
2	144	215	89	e45	e120	e600	808	397	2100	1530	741	289
3	163	239	e160	e45	e120	e800	765	399	1860	5300	669	287
4	165	217	e160	e50	e120	e1000	725	427	1550	9460	604	281
5	157	197	e150	e50	e120	e1500	634	456	1370	4110	561	283
6	160	180	e140	e50	e120	e2500	614	534	1450	2070	534	290
7	208	183	e150	e50	e120	e3000	569	590	3350	1360	595	269
8	187	200	e160	e50	e120	e2500	558	587	6730	1090	725	260
9	165	297	e160	e55	e120	e1500	509	1590	4680	1030	560	246
10	164	290	e150	e60	e110	1190	568	3330	4470	1040	472	237
11	140	256	e140	e55	e90	792	571	2540	4900	1010	405	223
12	127	237	e130	e50	e80	517	570	2420	2910	1310	366	213
13	135	225	e120	e50	e70	412	588	1730	2170	1920	357	214
14	149	236	e100	e45	e60	423	694	1250	1830	1090	352	212
15	213	252	e100	e50	e50	607	729	1060	1730	799	348	212
16	204	254	e100	e50	e45	504	666	1110	1690	852	347	220
17	221	221	e90	e55	e40	393	597	1400	1580	1310	323	223
18	183	225	e80	e60	e50	646	570	1690	1540	2510	407	227
19	200	215	e90	e65	e55	890	675	1790	1650	2220	424	222
20	188	237	e100	e70	e60	813	771	1810	2220	1440	377	221
21	188	229	e100	e80	e55	1270	675	1570	2930	1160	386	212
22	173	221	e90	e90	e55	1200	541	1820	2510	1580	369	203
23	187	213	e100	e100	e50	1450	528	1580	2010	1210	813	204
24	247	221	e100	e100	e45	1450	538	1760	1760	1670	937	210
25	237	221	e110	e120	e50	2050	504	2130	1880	1430	887	206
26	236	220	e110	e150	e60	1860	472	1810	1730	1060	784	198
27	195	102	e100	e150	e90	1440	487	1560	1570	2870	593	197
28	218	56	e90	e130	e200	1230	465	1440	1540	3920	501	203
29	269	44	e60	e100	---	1090	457	1360	1470	2190	428	215
30	321	26	e50	e100	---	979	432	1400	1500	1410	384	220
31	217	---	e40	e130	---	853	---	1700	---	991	342	---
TOTAL	5909	6135	3378	2300	2405	35859	18114	43646	70670	62452	16448	7011
MEAN	191	204	109	74.2	85.9	1157	604	1408	2356	2015	531	234
MAX	321	297	160	150	200	3000	834	3330	6730	9460	937	314
MIN	127	26	40	45	40	393	432	397	1370	799	323	197
AC-FT	11720	12170	6700	4560	4770	71130	35930	86570	140200	123900	32620	13910

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1993, BY WATER YEAR (WY)

(WY)	235	206	145	137	430	1254	751	1144	1675	586	214	173
1941	921	427	417	476	3850	4627	3062	5970	8045	2015	1096	898
1987	1942	1981	1943	1972	1965	1978	1944	1944	1993	1941	1941	1941
1961	1.77	12.5	12.5	4.53	2.82	80.2	109	142	123	14.4	1.30	.19
1961	1961	1961	1950	1950	1950	1961	1961	1966	1988	1988	1988	1960

SUMMARY STATISTICS

	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1939 - 1993
ANNUAL TOTAL	117961	274327	579
ANNUAL MEAN	322	752	1622
HIGHEST ANNUAL MEAN			79.4
LOWEST ANNUAL MEAN			1944
HIGHEST DAILY MEAN	2430	Jun 19	1961
LOWEST DAILY MEAN	11	Jun 12	1943
ANNUAL SEVEN-DAY MINIMUM	16	Jun 7	1950
INSTANTANEOUS PEAK FLOW		13400	31000
INSTANTANEOUS PEAK STAGE		8.77	12.20a
INSTANTANEOUS LOW FLOW		19	1988
ANNUAL RUNOFF (AC-FT)	234000	544100	419300
10 PERCENT EXCEEDS	649	1810	1350
50 PERCENT EXCEEDS	200	342	230
90 PERCENT EXCEEDS	86	60	40

--Backwater from ice.

--On many days in 1950, 1960-61, and 1988.

---Estimated.



## POWDER RIVER NEAR LOCATE, MONT.

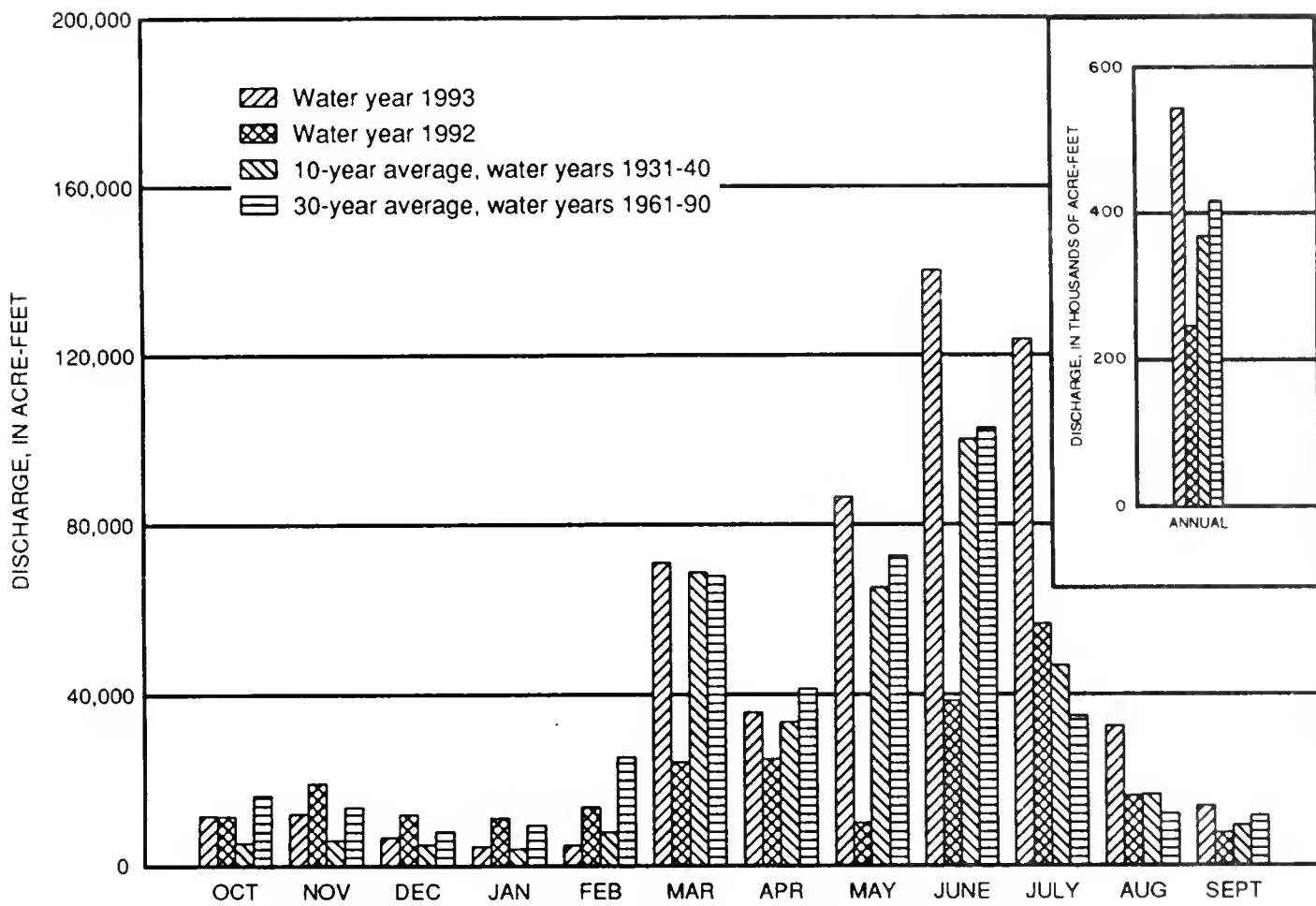


Figure 4.--Comparison of discharge of the Powder River during water year 1993 with discharge during water year 1992 and with 10-year and 30-year average discharges.



MONTHLY SUMMARY OF CONTENTS FOR COMPACT RESERVOIRS COMPLETED AFTER JANUARY 1, 1950

06258900 Boysen Reservoir, Wyo.

LOCATION.--Lat  $43^{\circ}25'00''$ , long  $108^{\circ}10'37''$ , in NW1/4 NW1/4 sec. 16, T. 5 N., R. 6 E., Fremont County, Hydrologic Unit 10080005, at dam on Wind River and 13 mi north of Shoshoni, Wyoming.

DRAINAGE AREA.--7,700 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1951 to current year (monthend contents only).

GAGE.--Water-stage recorder. Datum of gage is feet above sea level (levels by U.S. Bureau of Reclamation).

REMARKS.--Reservoir is formed by rock-fill dam completed in October 1951. Storage began Oct. 11, 1951. Usable capacity, 742,100 acre-ft between elevation 4,657.00 ft, invert of penstock pipe, and 4,725.00 ft, top of spillway gate. Dead storage, 59,880 acre-ft below elevation 4,657.00 ft. Prior to Jan. 1, 1966, usable capacity was 757,800 acre-ft and dead storage was 62,000 acre-ft at same elevations. Crest of dam is at elevation 4,758.00 ft. Figures given herein represent usable contents. Water used for irrigation, flood control, and power development.

COOPERATION.--Elevations and capacity table furnished by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents, 862,500 acre-ft, July 6, 7, 1967, elevation, 4,730.83 ft; minimum daily contents since normal use of water started, 191,900 acre-ft, Mar. 18, 19, 1956, elevation, 4,684.18 ft, capacity table then in use.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 747,700 acre-ft, June 24, elevation, 4,725.28 ft; minimum daily contents, 515,100 acre-ft, Oct. 26, 27, elevation, 4,712.00 ft.

<u>Month</u>	<u>Water-surface elevation, in feet</u>	<u>Usable contents, in acre-feet</u>	<u>Change in usable contents, in acre-feet</u>
September 30, 1992. . . . .	4,712.67	525,500	---
October 31. . . . .	4,712.08	516,400	-9,100
November 30 . . . . .	4,712.27	519,300	+2,900
December 31 . . . . .	4,712.23	518,700	-600
January 31, 1993. . . . .	4,712.21	518,400	-300
February 28 . . . . .	4,712.25	519,000	+600
March 31. . . . .	4,713.63	540,700	+21,700
April 30. . . . .	4,714.15	548,900	+8,200
May 31. . . . .	4,718.41	620,400	+71,500
June 30 . . . . .	4,724.86	739,400	+119,000
July 31 . . . . .	4,723.61	715,300	-24,100
August 31 . . . . .	4,723.00	707,700	-11,600
September 30, 1993. . . . .	4,721.58	677,200	-26,500
1993 water year			+151,700



06260300 Anchor Reservoir, Wyo.

LOCATION.--Lat 43°39'50", long 108°49'27", in sec. 26, T. 43 N., R. 100 W., Hot Springs County, Hydrologic Unit 10080007, at dam on South Fork Owl Creek, 2 mi downstream from Middle Fork, 3 mi southeast of Anchor, and 32 mi west of Thermopolis.

DRAINAGE AREA.--131 mi<sup>2</sup>.

PERIOD OF RECORD.--November 1960 to current year (monthend contents only).

GAGE.--Water-stage recorder. Datum of gage is feet above sea level (U.S. Bureau of Reclamation benchmark).

REMARKS.--Reservoir is formed by concrete arch dam completed in 1960. Usable capacity, 17,160 acre-ft between elevation 6,343.75 ft, invert of river outlet, and 6,441.00 ft, spillway crest, not including 68 acre-ft below elevation 6,343.75 ft. Prior to Oct. 1, 1971, usable capacity was 17,280 acre-ft not including 149 acre-ft below the invert. Figures given herein represent usable contents. Water is used for irrigation of land in Owl Creek basin.

COOPERATION.--Records furnished by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents, 9,250 acre-ft, July 4, 1967, elevation, 6,418.52 ft; no usable storage on many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 6,360 acre-ft, June 30, July 5-8, elevation, 6,409.40 ft; minimum daily contents, 64 acre-ft, Sept. 12-30, elevation, 6,343.50 ft.

<u>Month</u>	<u>Water-surface elevation, in feet</u>	<u>Usable contents, in acre-feet</u>	<u>Change in usable contents, in acre-feet</u>
September 30, 1992	6,367.90	784	---
October 31	6,347.00	106	-678
November 30	6,348.30	124	+18
December 31	6,349.80	145	+21
January 31, 1993	6,349.80	145	0
February 28	6,349.80	145	0
March 31	6,356.40	295	+150
April 30	6,357.00	314	+19
May 31	6,394.40	3,520	+3,206
June 30	6,409.40	6,360	+2,840
July 31	6,398.40	4,180	-2,180
August 31	6,364.50	604	-3,576
September 30, 1993	6,343.50	64	-540
1993 water year			-720



06286400 Bighorn Lake near St. Xavier, Mont.

LOCATION.--Lat  $45^{\circ}18'27''$ , long  $107^{\circ}57'26''$ , in SW1/4 SE1/4 sec. 18, T. 6 S., R. 31 E., Big Horn County, Hydrologic Unit 10080010, in block 13 of Yellowtail Dam on Bighorn River, 1.3 mi upstream from Grapevine Creek, 15.5 mi southeast of St. Xavier, and at river mile 86.6.

DRAINAGE AREA.--19,626 mi<sup>2</sup>.

PERIOD OF RECORD.--November 1965 to current year (monthend contents only). Prior to October 1969, published as "Yellowtail Reservoir."

GAGE.--Water-stage recorder in powerhouse control room. Datum of gage is feet above sea level (levels by U.S. Bureau of Reclamation).

REMARKS.--Reservoir is formed by thin concrete-arch dam; construction began in 1961; completed in 1967. Storage began Nov. 3, 1965. Usable capacity, 1,356,000 acre-ft between elevation 3,296.50 ft, river outlet invert, and 3,657.00 ft, top of flood control. Elevation of spill-way crest, 3,593.00 ft. Normal maximum operating level, 1,097,000 acre-ft, elevation, 3,640.00 ft. Minimum operating level, 483,400 acre-ft, elevation 3,547.00 ft. Dead storage, 16,010 acre-ft below elevation 3,296.50 ft. Figures given herein represent usable contents. Water is used for power production, flood control, irrigation, and recreation.

COOPERATION.--Elevations and capacity table furnished by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents, 1,346,000 acre-ft, July 6, 1967, elevation, 3,656.43 ft; minimum daily contents since first filling, 641,900 acre-ft, Apr. 14, 1989, elevation, 3,583.30 ft.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 1,100,000 acre-ft, July 7, elevation, 3,643.48 ft; minimum daily contents, 799,800 acre-ft, May 2, elevation, 3,611.95 ft.

<u>Month</u>	<u>Water-surface elevation, in feet</u>	<u>Usable contents, in acre-feet</u>	<u>Change in usable contents, in acre-feet</u>
September 30, 1992 . . . . .	3,637.74	1,026,000	---
October 31 . . . . .	3,639.58	1,049,000	+23,000
November 30. . . . .	3,635.75	1,003,000	-46,000
December 31. . . . .	3,627.53	920,400	-82,600
January 31, 1993 . . . . .	3,618.84	848,700	-71,700
February 28. . . . .	3,614.19	815,000	-33,700
March 31 . . . . .	3,614.17	814,900	-100
April 30 . . . . .	3,612.01	800,200	-14,700
May 31 . . . . .	3,631.49	958,100	+157,900
June 30. . . . .	3,642.05	1,081,000	+122,900
July 31. . . . .	3,639.21	1,044,000	-37,000
August 31. . . . .	3,637.28	1,021,000	-23,000
September 30, 1993 . . . . .	3,638.82	1,039,000	+18,000
1993 water year			+13,000



MONTHLY SUMMARY OF CONTENTS FOR COMPACT RESERVOIRS EXISTING ON JANUARY 1, 1950

The extent, if any, of the use of reservoirs in this section which may be subject to Compact allocations was not determined. As a matter of hydrologic interest the monthend contents in acre-feet of four reservoirs are given. The first three reservoirs are in the Bighorn River basin, Wyoming, and data on contents were furnished by the U.S. Bureau of Reclamation. The Tongue River Reservoir in Montana is operated under the supervision of the Water Resources Division of the Montana Department of Natural Resources and Conservation, which furnished the water level data.

<u>Month</u>	<u>Contents, in acre-feet</u>			
	<u>06224500</u> <u>a/Bull Lake</u>	<u>b/Pilot</u> <u>Butte</u> <u>Reservoir</u>	<u>c/Buffalo</u> <u>Bill</u> <u>Reservoir</u>	<u>06281500</u> <u>d/Tongue</u> <u>River</u> <u>Reservoir</u>
September 30, 1992. . .	51,510	12,520	270,400	27,840
October 31. . . . .	53,290	27,980	264,300	20,810
November 30 . . . . .	53,530	27,710	273,600	18,350
December 31 . . . . .	53,990	27,680	279,400	18,350
January 31, 1992. . . .	54,710	27,630	284,500	18,350
February 29 . . . . .	54,940	27,560	287,400	18,350
March 31. . . . .	55,340	27,500	292,900	16,720
April 30. . . . .	55,510	28,770	271,200	22,120
May 31. . . . .	91,930	29,010	376,600	44,980
June 30 . . . . .	145,600	29,700	494,900	46,940
July 31 . . . . .	146,500	17,780	525,600	50,270
August 31 . . . . .	137,300	23,250	485,100	28,620
September 30, 1993. . .	94,740	14,750	417,900	24,440
Change in contents during water year. .	+43,230	+2,230	+147,500	-3,400

a/ Usable contents, from revised capacity table effective October 1, 1965. Dead storage is 722 acre-ft.

b/ Usable contents. Dead storage is 5,360 acre-ft.

c/ Usable contents, from revised capacity table based on survey of 1959. Usable contents prior to October 1960 based on survey of 1941. Dead storage is negligible.

d/ Usable contents. Dead storage is 1,400 acre-ft. Contents based upon sedimentation surveys of October 1948.



RULES AND REGULATIONS FOR ADMINISTRATION OF  
THE YELLOWSTONE RIVER COMPACT

A compact, known as the Yellowstone River Compact, between the States of Wyoming, Montana, and North Dakota, having become effective on October 30, 1951, upon approval of the Congress of the United States, which apportions the waters of certain interstate tributaries of the Yellowstone River which are available after the appropriative rights existing in the States of Wyoming and Montana on January 1, 1950 are supplied, and after appropriative rights to the use of necessary supplemental water are also supplied as specified in the Compact, is administered under the following rules and regulations subject to the provisions for amendment revision or abrogation as provided herein.

Article I. Collection of Water Records

A. It shall be the joint and equal responsibility of the members of the States of Wyoming and Montana to collect, cause to be collected, or otherwise furnish records of tributary streamflow at the points of measurement specified in Article V (B) of the Compact, or as near thereto as is physically or economically feasible or justified.

1. Clarks Fork

The gaging station known as Clarks Fork near Silesia, Montana and located in NW1/4 SE1/4 sec. 1, T. 4 S., R. 23 E., shall be the point of measurement for the Clarks Fork.

2. Bighorn River (exclusive of Little Bighorn River)

The gaging station known as the Bighorn River above Tullock Creek, near Bighorn, Montana, and located in SE1/4 SE1/4 NE1/4 sec. 3, T. 4 N., R. 34 E., shall temporarily be the designated point of measurement on that stream. The flow of the Little Bighorn River as measured at the gaging station near Hardin, Montana, and located in SE1/4 NE1/4 NE1/4 sec. 19, T. 1 S., R. 34 E., shall be considered the point of measurement for that stream, except that if or when satisfactory records are not available, the records for the nearest upstream station with practical corrections for intervening inflow or diversion shall be used.

3. Tongue River

The gaging station known as the Tongue River at Miles City, Montana, and located in NE1/4 NE1/4 SE1/4 sec. 23, T. 7 N., R. 47 E., shall temporarily be the point of measurement for that stream.



#### 4. Powder River

The gaging station known as the Powder River near Locate, Montana, and located in NW1/4 SW1/4 sec. 14, T. 8 N., R. 51 E., shall temporarily be the designated point of measurement for that stream.

- B. Records of total annual diversion in acre-feet above the points of measurement designated in the Compact for irrigation, municipal, and industrial uses developed after January 1, 1950, shall be furnished by the members of the Commission for their respective States, at such time as the Commission deems necessary for interstate administration as provided by the terms of the Compact. Providing that if it be acceptable to the Commission, reasonable estimates thereof may be substituted.
- C. Annual records of the net change in storage in all reservoirs, not excluded under Article V (E) of the Compact, above the point of measurement specified in the Compact and completed after January 1, 1950, and the annual net change in reservoirs existing prior to January 1, 1950, which is used for irrigation, municipal, and industrial purposes developed after January 1, 1950, shall be the primary responsibility of the member of the Commission in whose State such works are located; providing such data are not furnished by Federal agencies under the provisions of Article III (D) of the Compact, or collected by the Commission.

#### Article II. Office and Officers

- A. The office of the Commission shall be located at the office of the Chairman of the Commission.
- B. The Chairman of the Commission shall be the Federal representative as provided in the Compact.
- C. The Secretary of the Commission shall be as provided for in Article III of these rules.
- D. The credentials of each member of the Commission shall be placed on file in the office of the Commission.

#### Article III. Secretary

- A. The Commission, subject to the approval of the Director of the United States Geological Survey, shall enter into cooperative agreements with the U.S. Geological Survey for such engineering and clerical services as may reasonably be necessary for the administration of the Compact. Said agreements shall provide that the Geological Survey shall:



1. Maintain and operate gaging stations at or near the points of measurement specified in Article V (A) of the Compact.
2. Assemble factual information on stream flow, diversion, and reservoir storage for the preparation of an annual report to the Governors of the signatory States.
3. Make such investigations and reports as may be requested by the Commission in aid of its administration of the Compact.

B. The Geological Survey shall act as Secretary to the Commission.

#### Article IV. Budget

- A. At the annual meeting of each even-numbered year or prior thereto, the Commission shall adopt a budget for operation during the ensuing biennium beginning July first. Such budget shall set forth the total cost of construction, maintenance and operation of gaging stations, the cost of engineering and clerical aid, and other necessary expenses excepting the salaries and personal expenses of the Commissioners. On odd-numbered years revisions of the budget shall be considered.
- B. It shall be the obligation of the Commissioners of the States of Montana and Wyoming to endeavor to secure from the Legislature of their respective States sufficient funds with which to meet the obligations of this Compact, except insofar as provided by the Federal government.

#### Article V. Meetings

An annual meeting of the Commission shall be held each November at some mutually agreeable point in the Yellowstone River Basin for consideration of the annual report for the water year ending the preceding September 30th, and for the transaction of such other business consistent with its authority; provided that by unanimous consent of the Commission the date and place of the annual meeting may be changed. Other meetings as may be deemed necessary shall be held at a time and place set by mutual agreement, for the transaction of any business consistent with its authority.



No action of the Commission shall be effective until approval by the Commissioners for the States of Wyoming and Montana.

Article VI. Amendments, Revisions and Abrogations.

The Rules and Regulations of the Commission may be amended or revised by a unanimous vote at any meeting of the Commission.

*Gary Fritz*  
\_\_\_\_\_  
Gary Fritz  
Commissioner for Montana

*George L. Christopoulos*  
\_\_\_\_\_  
George L. Christopoulos  
Commissioner for Wyoming

ATTESTED:

*L. Grady Moore*  
\_\_\_\_\_  
L. Grady Moore  
Federal Representative

Adopted November 17, 1953  
Amended December 16, 1986



## RULES FOR ADJUDICATING WATER RIGHTS ON INTERSTATE DITCHES

### Article I. Purpose

The purpose of this rule is to determine and adjudicate, in accordance with the laws of Montana and Wyoming, those pre-Compact (January 1, 1950) water rights diverting from the Powder, Tongue, Bighorn and Clarks Fork Rivers and their tributaries where the point of diversion is in one State and the place of use is in the other State which have not yet been adjudicated.

### Article II. Authority

In accordance with the Yellowstone River Compact, the State of Montana and the State of Wyoming, being moved by consideration of interstate comity, desire to remove all causes of present and future controversy between the States and between persons in one State and persons in another State with respect to these interstate ditches. Article III (E) of the Compact provides the Yellowstone River Compact Commission with the authority "...to formulate rules and regulations and to perform any act which they may find necessary to carry out the provisions of this Compact...."

### Article III. Definitions

The terms defined in the Yellowstone River Compact apply as well as the following definitions:

1. "Acre-feet" means the volume of water that would cover 1 acre of land to a depth of 1 foot.
2. "Cfs" means a flow of water equivalent to a volume of 1 cubic foot that passes a point in 1 second of time and is equal to 40 miners inches in Montana.
3. "Interstate Ditches" shall include ditches and canals which convey waters of the Bighorn, Tongue, Powder, and Clarks Fork Rivers and their tributaries across the Wyoming-Montana State line where the water is diverted in one State and the place of use is in the other State.
4. "Department of Natural Resources and Conservation," hereafter called the "Department," means the administrative agency and Department of the Executive Branch of the Government of Montana created under Title II, Chapter 15, MCA which has the responsibility for water administration in that State.



5. "Water Court" means a Montana District Court presided over by a water judge, as provided for in Title III, Chapter 7, MCA.
6. "State Engineer" shall be the current holder of the position created by the Wyoming Constitution as Chief Water Administration Official for the State of Wyoming.
7. "Board of Control," hereinafter called the "Board," is defined as the constitutionally created water management agency in Wyoming composed of the four Water Division Superintendents and the State Engineer.
8. "Superintendent" is the member of the Board who is the water administration official for the Water Division where the interstate ditch is located. (The two Water Divisions in the Yellowstone River drainage are Water Division Numbers Two and Three.)
9. "Date of Priority" shall mean the earliest date of actual beneficial use of water, unless evidence and circumstances pertaining to a particular claim establish an earlier date.
10. "Point of Diversion" is defined to be the legal land description by legal subdivision, section, township, and range of the location of the diversion structure for an interstate ditch from a natural stream channel.
11. "Place of Use" is defined to be the legal land description (legal subdivision, section, township, and range) of the lands irrigated by an interstate ditch.
12. "Person" is defined as an individual, a partnership, a corporation, a municipality or any other legal entity, public or private.
13. "Claimant" is defined as any person claiming the use of water from an interstate ditch as herein defined.

#### Article IV. Procedures

The procedures for determining and adjudicating water rights associated with interstate ditches shall be categorized as follows: (A) Where the point of diversion is in Wyoming and place of use in Montana, and (B) Where the point of diversion is in Montana and place of use in Wyoming.



## A. Wyoming Procedure

1. The Yellowstone River Compact Commission will provide a claim form to be completed by the claimant that will describe the location and point of diversion and land being irrigated, the priority date claimed, method of irrigation and such other information required to describe the claim. (A sample form for this purpose is attached.)
2. The Yellowstone River Compact Commission will send the claim form to water users on the interstate ditches.
3. Water users will complete the claim form and file it with the Yellowstone Compact Commission, which, when found to be correct and complete, will be forwarded to the Board for verification.
4. Upon receipt of the form, the Board shall forward it to the appropriate Superintendent, who, in cooperation with the Department, will validate the information including the use that has been made of the water, the number of acres and location of lands being irrigated, the priority date, and all other relevant information. The Superintendent and the Department will utilize aerial photography and other information to have prepared a reproducible map showing the location of the ditch system, lands irrigated, point of diversion, etc., of the claim.
5. After the validation procedure, the Superintendent will hold a hearing, after appropriate notice and advertisement, at which time the claimant shall describe, in detail, the use that has been made of the water and the lands that are being irrigated, establish a priority date, etc. Costs incurred in advertising shall be paid by the claimant. If a single hearing is held to consider several claims, the costs of advertising shall be shared equally among the claimants. Anyone who opposes the claim shall appear and state the reasons, if any, for opposition to the claim. If there is no opposition to the claim, cost incurred in holding the hearing shall be paid by the claimant. If protestants do appear and oppose the claim, hearing costs will be paid 50 percent by the claimant and 50 percent by the protestant, or if there is more than one protestant, the remaining 50 percent shall be shared equally among the protestants.
6. At the conclusion of the hearing, the Superintendent shall forward the record to the Yellowstone River Compact Commission with his findings and recommendations. The Yellowstone River Compact Commission will make the



determination of the amount of the right, the location, and the priority date, and then send the record to the Board.

7. The Board shall review the record and integrate it into its water rights system. Upon entry of the record by the Board, the information shall be forwarded to the Department and the Chairman of the Yellowstone River Compact Commission.
8. Upon the entry of the right into the Board's records, it will have the following attributes:
  - a. The right will be a Wyoming water right with a priority date as established by this procedure.
  - b. The amount of the right will be determined as provided by Wyoming law.

#### B. Montana Procedure

1. The Yellowstone River Compact Commission will provide a claim form to be completed by the claimant that will describe the location and point of diversion and land being irrigated, the priority date claimed, method of irrigation and such other information required to describe the claim.
2. The Commission will send the claim form to water users on the interstate ditches.
3. Water users will complete the claim form and file it with the Yellowstone River Compact Commission, which, when found to be correct and complete, will be forwarded to the Department for verification.
4. Upon receipt of the form, the Department, in cooperation with the Wyoming State Engineer's Office, will validate the information, including the use that has been made of the water, the number of acres and location of lands being irrigated, the priority date, and all other relevant information. The appropriate Superintendent and the Department will utilize aerial photographs and other information to have prepared a reproducible map showing the location of the ditch system, land irrigated, point of diversion, etc., of the claim.



5. The Department will then forward the record to the Yellowstone River Compact Commission with its findings and recommendations. Upon approval by the Commission, the record shall be submitted to the Montana Water Court for adjudication. A duplicate record will be forwarded to the Wyoming State Engineer's Office, the Board, and the Chairman of the Yellowstone River Compact Commission upon adjudication.
6. Upon adjudication of the right by the Montana Water Court, it will have the following attributes:
  - a) The right will be a Montana water right with a priority date as established by this procedure.
  - b) The amount of the right will be determined as provided by Montana law.

#### Article V. Exclusions

- A. These rules recognize the limitation in Article VI of the Yellowstone River Compact regarding Indian water rights.
- B. These rules shall not be construed to determine or interpret the rights of the States of Wyoming and Montana to the waters of the Little Bighorn River.

#### Article VI. Claim Form Submission Period

All claims must be submitted to the Yellowstone River Compact Commission, c/o District Chief, United States Geological Survey, 821 E. Interstate, Bismarck, ND 58501, within 90 calendar days after the claimant has received the claim form from the Commission. The blank claim form will be sent certified mail to the water user and the submission period of 90 calendar days will begin with the next day following receipt of the form, as evidenced by the certified mail receipt card. For good cause shown in writing, an extension of time beyond the 90 days for submittal may be obtained from the Commission.



# YELLOWSTONE RIVER COMPACT COMMISSION

## WYOMING

GORDON W. FASSETT  
STATE ENGINEER  
HERSCHEER BUILDING  
4TH FLOOR EAST  
CHEYENNE, WYOMING 82002  
(307) 777-7354

## UNITED STATES

WILLIAM F. HORAK  
CHAIRMAN  
U.S. GEOLOGICAL SURVEY  
821 E. INTERSTATE AVENUE  
BISMARCK, NORTH DAKOTA 58501  
(701) 250-4601

## MONTANA

GARY FRITZ  
ADMINISTRATOR, WATER RESOURCES DIVISION  
DEPT. OF NATURAL RESOURCES & CONSERVATION  
1520 EAST SIXTH AVENUE  
HELENA, MONTANA 59620  
(406) 444-6603

## YELLOWSTONE RIVER COMPACT COMMISSION

### CLAIM FORM FOR INTERSTATE DITCHES

1. Name of ditch or canal: \_\_\_\_\_
2. Source of water supply: \_\_\_\_\_  
Tributary of \_\_\_\_\_
3. Name of claimant: \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_  
Home Phone No. \_\_\_\_\_ Business Phone No. \_\_\_\_\_
4. Person completing form: \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_  
Home Phone No. \_\_\_\_\_ Business Phone No. \_\_\_\_\_
5. Method of irrigation: \_\_\_\_\_
6. Point of diversion: County \_\_\_\_\_ State \_\_\_\_\_  
Headgate located in the  $\frac{1}{4}$  \_\_\_\_\_, Section \_\_\_\_\_, T.\_\_\_\_R.\_\_\_\_\_  
(a) Description of headgate: (Briefly describe the materials and general features, date constructed or last known work, general condition.)  
\_\_\_\_\_  
\_\_\_\_\_



(b) Describe water measuring device: \_\_\_\_\_

(c) If the point of diversion is in Montana:

1. What flow rate has been claimed?

- cubic feet per second
- gallons per minute
- miner's inches

2. What volume of water has been claimed?

acre-feet

7. Dimensions of ditch at headgate: Width at top (at waterline) \_\_\_\_\_ feet; width at bottom \_\_\_\_\_ feet; side slopes (vertical:horizontal) \_\_\_\_\_:\_\_\_\_\_; depth of water \_\_\_\_\_ feet; grade \_\_\_\_\_ feet per mile.

8. Place of use and acres irrigated: County \_\_\_\_\_ State \_\_\_\_\_  
Give legal subdivisions of land owned by you on which water  
is being used (acres claimed): An example field is shown in  
the first line.



9. Describe any additional uses of water claimed from the ditch:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

10. Date of first beneficial use of water (priority date) on lands described above for \_\_\_\_\_ Ditch is \_\_\_\_\_ (mo/day/yr)  
and shall be the same for all lands claimed on this form.

11. Has irrigation water been diverted onto all lands shown in the above tabulation each year since completion of works? \_\_\_\_\_  
If not, state exceptions and reasons therefore:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

12. Attach documentary evidence or affidavits showing your ownership or control of the above lands, as well as the historic use of water on these lands.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

13. What permit or claim numbers have been assigned to known records filed with either the Wyoming State Engineer's Office or the Montana Department (DNRC) for irrigating the above lands?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

14. Have personnel in the Wyoming State Engineer's Office or the Montana Department (DNRC) been contacted to obtain the information given in No. 13? ( ) Yes ( ) No

15. Describe any flumes or pipelines in the ditch conveyance system:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



16. Describe ordinary annual period of use: \_\_\_\_\_ to \_\_\_\_\_  
(mo/day) (mo/day)

\_\_\_\_\_.

17. Attach copies of aerial photographs, U. S. Geological Survey maps or other such documents showing the ditch and lands irrigated that give evidence to this claim and may be useful to the Commission.

\* \* \* \* \*

State of \_\_\_\_\_ )  
State of \_\_\_\_\_ ) SS

I, \_\_\_\_\_, having been duly sworn, depose and say that I, being of legal age and being the claimant of this claim for a water right, and the person whose name is signed to it as the claimant, know the contents of this claim and the matters and things stated there are correct.

\_\_\_\_\_  
\_\_\_\_\_

Subscribed and sworn before me, this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_.

\_\_\_\_\_  
Notary Public

Residing at: \_\_\_\_\_

My commission expires: \_\_\_\_\_



## CONVERSION TABLE

Multiply inch-pound units      By      To obtain SI units

*Length*

feet (ft)	0.3048	meters (m)
miles (mi)	1.609	kilometers (km)

*Area*

acres	4,047	square meters ( $m^2$ )
	0.4047	*hectares (ha)
	0.4047	square hectometer ( $hm^2$ )
	0.004047	square kilometers ( $km^2$ )
square miles ( $mi^2$ )	2.590	square kilometers ( $km^2$ )

*Volume*

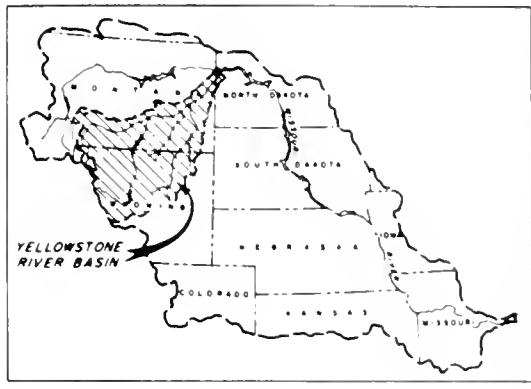
cfs-day or second-foot day ( $ft^3/s\text{-day}$ )	2,447	cubic meters ( $m^3$ )
	0.002447	cubic hectometers ( $hm^3$ )
cubic feet	0.02832	cubic meters
acre-feet (acre-ft)	1,233	cubic meters ( $m^3$ )
	0.001233	cubic hectometers ( $hm^3$ )
	0.000001233	cubic kilometers ( $km^3$ )

*Flow*

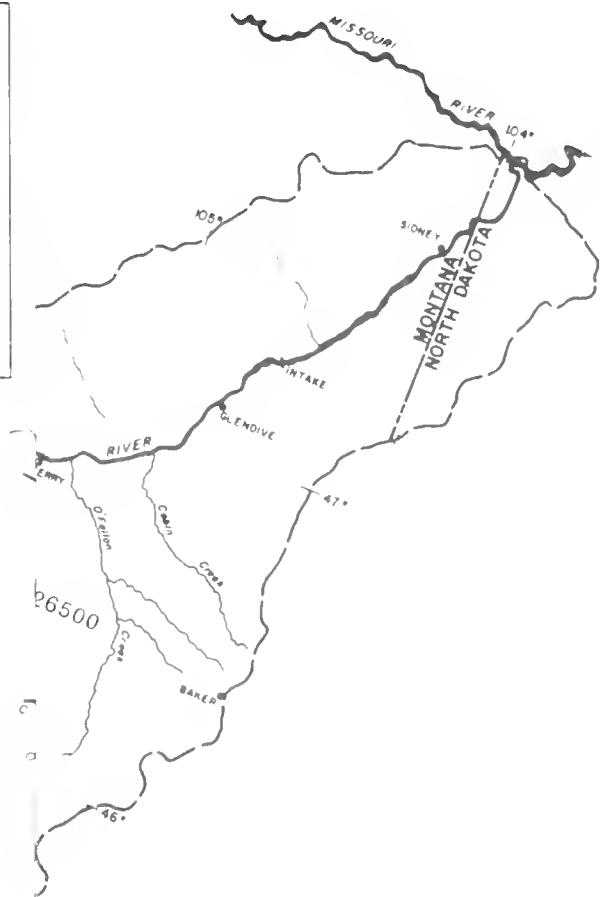
cubic feet per second ( $ft^3/s$ )	28.32	liters per second (L/s)
	28.32	cubic decimeters per second ( $dm^3/s$ )
	0.02832	cubic meters per second ( $m^3/s$ )
acre-feet per year (acre-ft/yr)	1,233	cubic meters per year ( $m^3/yr$ )
	0.001233	cubic hectometers per year ( $hm^3/yr$ )
	0.000001233	cubic kilometers per year ( $km^3/yr$ )

\*The unit hectare is approved for use with the International System (SI) for a limited time. See National Bureau of Standards Special Bulletin 330, p. 12, 1977 edition.





LOCATION MAP



YELLOWSTONE RIVER COMPACT COMMISSION  
**YELLOWSTONE RIVER BASIN**

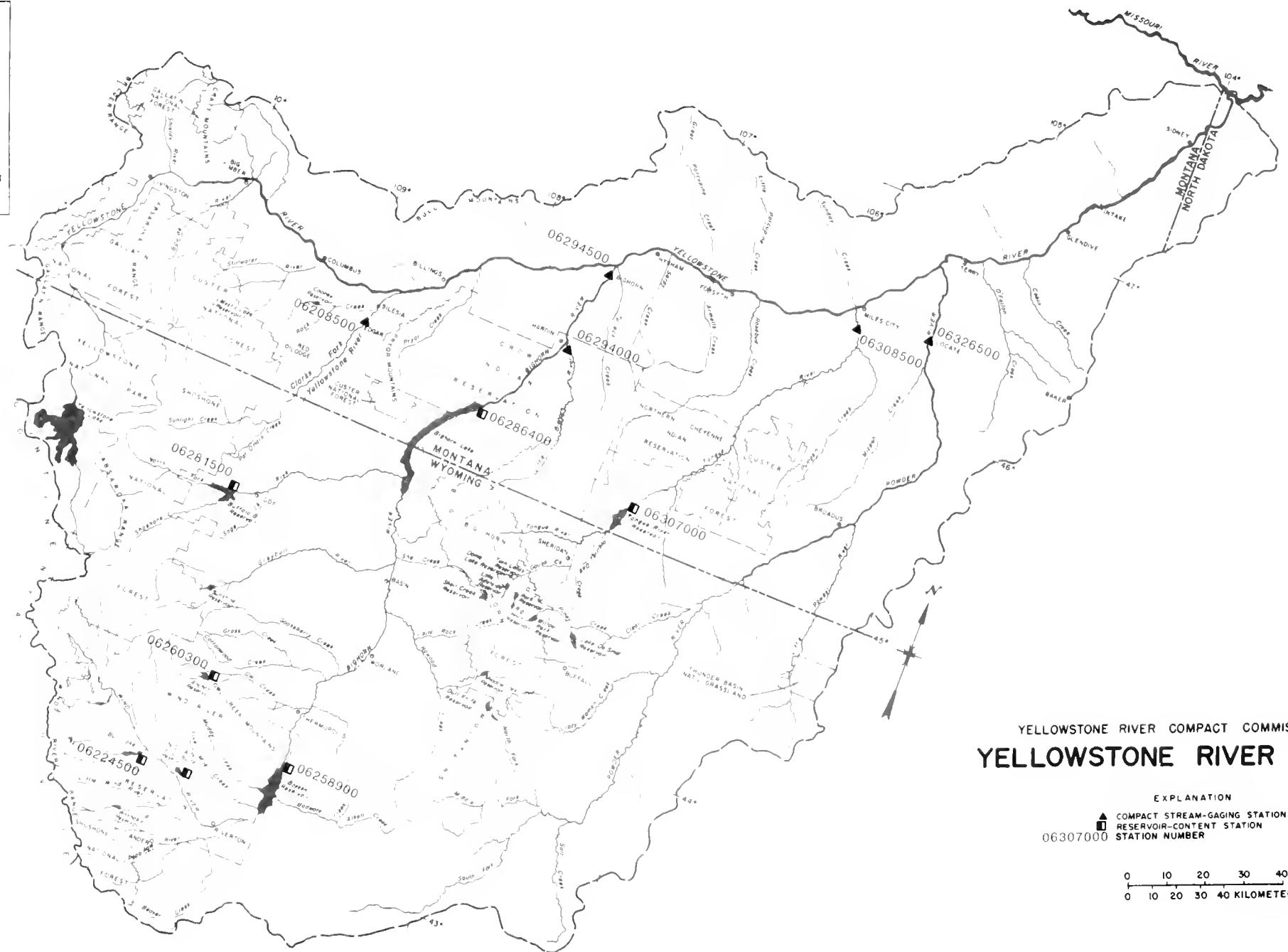
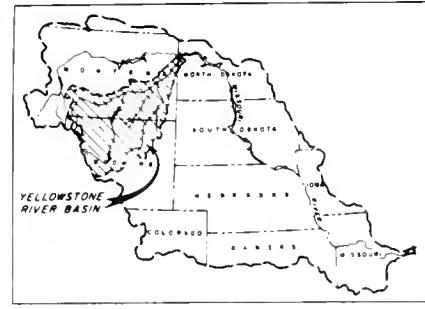
## EXPLANATION

▲ COMPACT STREAM-GAGING STATION  
 ■ RESERVOIR-CONTENT STATION  
 06307000 STATION NUMBER

0 10 20 30 40 MILES  
 0 10 20 30 40 KILOMETERS

MAP SHOWING LENS





MAP SHOWING LOCATIONS OF COMPACT STREAM-GAGING AND RESERVOIR-CONTENT STATIONS





